MEDICAL LIBRARY
EXTERNAL
OCT 4 1918
UNIV. OF MICH.

GAS JOURNAL

LIGHT · HEAT · POWER · BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CXLIII. No. 2888.] LONDON, SEPTEMBER 17, 1918. [70TH YEAR. PRICE 6d.

O'NEILL'S

OXIDE

GAS PURIFICATION AND CHEMICAL CO., Ltd.

PALMERSTON HOUSE, LONDON, E.C.

Telegrams: "PURIFICATION, LONDON."
Telephone: 9144 LONDON WALL.

KOPPERS' PATENT

CHAMBER OVENS.

Results obtained which have never been Surpassed by any other System of Carbonization.
Plants at Work and under Construction for the production of **70,000,000** cubic feet of Gas per Day.

See our large Advertisement appearing in alternate issues of the "JOURNAL."

The KOPPERS' COKE OVEN AND BYE-PRODUCT CO.,
301, Glossop Road, SHEFFIELD.

R. & W. HAWTHORN LESLIE & CO., LTD.

In Stock.

TANK LOCOMOTIVES

Always in Progress.

Locomotive & Marine Engineers & Shipbuilders,
NEWCASTLE-ON-TYNE.

INTERMITTENT VERTICALS.

Adopted all over the World.

Vertical Gas Retort Syndicate LTD.,
17, VICTORIA ST., WESTMINSTER, S.W.

Sole Agents for Australasia—
JAMES HURLL & CO. LTD., SYDNEY.

TORBAY STOVE BLACK FOR GAS COOKERS.

The TORBAY PAINT CO.,
26/28, Billiter St., LONDON, E.C. 3.
39/41, Old Hall St., LIVERPOOL.

GAS & CANNEL COAL CONTRACTORS.

WM. F. RUSSELL & SONS.

Telegrams for all Offices: 'MONKLAND."

GLASGOW: 90, Mitchell Street;
NEWCASTLE: Exchange Buildings;
HULL: Exchange Buildings, Lowgate;
LIVERPOOL: 5, Castle St.; &
SWANSEA: Atlantic Buildings.

JAMES McKELVIE & CO.

Coal Owners,
Gas and Steam Coal Contractors,
17, RUTLAND SQUARE, EDINBURGH.

59, MARK LANE, LONDON, E.C.
GUILDHALL CHAMBERS, SANDHILL, NEWCASTLE-ON-TYNE.
24, CHAPEL STREET, LIVERPOOL.

ESTABLISHED 1840.

W. PARKINSON & CO.

(Incorporated in Parkinson and W. & B. Cowan, Ltd.),

LONDON & BIRMINGHAM.

(See Advertisement p. 522).

STEWARTS AND LLOYDS, LIMITED, 41, OSWALD STREET, GLASGOW. BROAD STREET CHAMBERS, BIRMINGHAM.

TUBES & FITTINGS for Gas, Steam, Water, &c.

GEORGE GLOVER & CO., LTD.,

DRY GAS METER MANUFACTURERS.

Agents for the Patent "M & M" SELF-LOCKING SLOT-METER PADLOCK.

The STRENGTH and SECURITY of the **"M & M"** Lock depend not upon its EXTERNAL SHAPE, which has been imitated in various quarters, but upon the SPECIAL CONSTRUCTION of its INTERNAL MECHANISM.

The special mechanism, consisting of a sliding bolt fitted with TWO STUMPS and DOUBLE-ACTION LEVERS, is FULLY PATENTED.

See that each lock is stamped **M & M,** *and beware of inferior imitations.*

LONDON:
RANELAGH WORKS,
ROYAL AVENUE, CHELSEA, S.W.3.
TELEPHONE: 1140 Kensington.
WIRE: "Dry Meters, London."

LEEDS:
9, DEWSBURY ROAD.
TELEPHONE: No. 26463.
WIRE: "Meters, Leeds."

MANCHESTER:
GAYTHORN METER WORKS, EASTON STREET.
TELEPHONE: No. 6898 City.
WIRE: "Slot, Manchester."

H. MITCHELL, FOR PATENT SLOT METER PAD & OTHER LOCKS. 34, Victoria St., S.W. 1. K. & J. DEMPSTER, LTD., KENTISH TOWN, N.W. MANCHESTER.

RITCHIE C.I. PIPES FOR GAS & WATER. MIDDLESBROUGH.

J. & J. BRADDOCK

(Branch of Meters Limited),

GLOBE METER WORKS,

Telegrams: "Braddock, Oldham." Telephone 815.

OLDHAM,

AND

45 & 47, WESTMINSTER BRIDGE ROAD,

Telegrams: "Metrique, Lamb London." Telephone 2412 Hop.

LONDON, S.E. 1.

MANUFACTURERS OF HIGH-CLASS

GAS STATION METERS.

BRADDOCK'S

STATION GOVERNORS

AND

RETORT-HOUSE GOVERNORS.

IMPROVED

WET & DRY GAS METERS

OF BEST QUALITY.

BRADDOCK'S PATENT

"SLOT" METERS.

FULL PARTICULARS ON APPLICATION.

ARROL-FOULIS

Stoking Machinery

HYDRAULIC COKE PUSHERS

(HUNTER and BARNETT'S PATENT.)

WILL DISCHARGE A RETORT IN ONE OPERATION

LARGE NUMBERS IN USE.

Full Particulars may be obtained from the Sole Makers,

SIR WILLIAM ARROL & CO., Limited,

GLASGOW.

LONDON ADDRESS: 56, VICTORIA STREET, S.W.

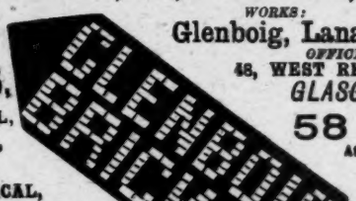
(See Advertisement, Aug. 13, p. 282.)

THE GLENBOIG UNION FIRE-CLAY Co. Ltd.

WORKS: Glenboig, Lanarkshire.

OFFICES: 48, WEST REGENT ST., GLASGOW.

GAS-RETORTS, HORIZONTAL, INCLINED, and VERTICAL, to New Standard Specification.



58 FIRST AWARDS At International and Home Exhibitions, including Grand Prize at Brussels, 1910.

In every case the highest award given for Fire Clay Goods.

The Glenboig Bricks, Blocks, and Retorts combine, in the highest degree, the qualities of not melting, and not splitting, when subjected to the highest heats and sudden changes of temperature, and are, in consequence, found to be economical, even in districts where the local bricks can be had at half the price.

DONKIN

for

GAS VALVES

SINGLE AND DOUBLE FACED.

EXHAUSTERS, COMPRESSORS, RATEAU TURBO GAS EXHAUSTERS, PUMPS.

THE BRYAN DONKIN COMPANY, LTD.

Head Offices & Works, **CHESTERFIELD.**

LONDON OFFICE: 3 VICTORIA STREET, WESTMINSTER, S.W. 1.

Chesterfield Telephone No. 84.
London Telephone No. 5358 Victoria.

Chesterfield Telegrams, "Donkin, Chesterfield."
London Telegrams, "Donkin, Vic. London."

GAS JOURNAL

LIGHT ✂ HEAT ✂ POWER ✂ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

VOL. CXLIII., No. 2888.] TUESDAY, SEPTEMBER 17, 1918. [70TH YEAR.

EDITORIAL NOTES.

The Investigation Movement.

CONSIDERABLE significance attaches to a single paragraph of less than half-a-dozen lines of print which appeared in the minutes of the meeting of the Executive Committee of the National Gas Council published in our columns last week. The paragraph was to the effect that resolutions from District Institutions and Associations of Gas Engineers and Managers had been submitted, in reference to the appointment of a Special Committee to investigate the position of the gas industry. A reply was directed to be sent, to the effect that action has already been taken in the matter, which it is hoped will attain the objects desired. These sentences comprise all the information that the paragraph contained; but it is actually a concentrated statement as to something which may have momentous issues in respect of the fortunes of the industry. At any rate, we sincerely hope so; and if the Committee in view is realized —say, through the action of one of the Government Departments—we shall feel adequately compensated for the part the "JOURNAL" has taken in helping to forward a movement which has for its object to release the industry from useless confining enactment, and to open to it new spheres of activity in which it can expand and be of larger service to the nation. If the country is to be industrially and commercially rejuvenated, energized, and made greater than the most sanguine minds may have pictured for it in the past, then it must make the utmost of its industrial resources by conferring freedom rather than imposing restriction, and by granting new conditions enabling them to do all that is desired of them, with reasonable regard for the co-ordination of the lines of development as between the different industries of the country, so that developments are not permitted which may be mutually destructive. For instance, the suggestion that the electricity industry should be permitted to introduce coal carbonization into its operations and the working-up of products, would at once mean the sacrifice of a large part of that latent economy in the operations of the gas industry which it hopes to bring to its credit through greater liberty and extended service. At the same time, the electricity industry could never make the maximum economy from its new work in view of the pre-existence of an industry performing the same functions, and operating in markets which would be necessary to fresh electrical development, but which are limited in their powers of absorption.

This request for an investigation by a competent tribunal into the conditions of the gas industry—its drawbacks and its potentialities—is a matter the importance of which to the industry is beyond any defining. This must be clearly apparent to anyone who thinks over the position into which the gas industry was drifting before the war, the position to which it has sunk during the war, and the position in which it may find itself after the war, with the changed conditions as to money, material, and labour, and, if the signs of intensified competition on all sides materialize as they not only threaten, but are bound to do through the natural evolution of things. This evolution has been hastened by the war, perhaps in one respect to the industry's disadvantage, but to its ultimate advantage in another, as it has in several directions provoked a larger and more active concern for the future welfare of the industry. To have men pass from a state of placid indifference to one of concern is a very substantial gain; to know that there are now numbers of men in the industry who realize that in this matter of providing for reformation, reorganization, reconstruction, and development, we must pursue objectives *pari passu* with other industries, even if we cannot get in advance of them, is also something materially good. It has, however, been observed only lately that there are still in existence those who advise a "wait-and-see" policy, who are quite willing for the industry to shirk this matter on the ground that the times are too much occupied with current functions and obligations to do anything to safeguard the future. While other industries find time for thought and plans for the future, those who so advise postponement for the gas industry are, either wittingly or unwittingly, its worst enemies; and the industry generally must decline to be put off from having its affairs opportunely investigated, its policy for the future sized-up so far as current conditions allow them to be, and its desires formulated in regard to several subjects. Preparation to defend the industry, to urge an advance of its interests in the common good and not for any more selfish purpose than protecting its established rights and possessions and lines of national development, is only an act of wisdom, though some men, without any really intelligible reason, think otherwise. The parable of the ten virgins contains lessons as appropiate to the present as to past times. Perhaps the cynical will not agree, but no matter.

Fortunately, the views of those who would defer are not the views of all; and those who are moving are not to be deterred. The gas industry has reaped consequences that are not of a congenial order through the quondam favourite policy of deferment. Hence there will be satisfaction over this the first publicly made official announcement "that action has already been taken in the matter which, it is "hoped, will attain the objects desired." The nature of this action need not be disclosed, as it is hoped that, if fortune favours claims, the completion of the preliminary stage will be a definite step by the chief of one of the Government Departments. A point has to be made regarding the form of the intimation. As it stands in the minutes, it must not be taken as being in the nature of a rebuff to the District Associations who have, through their Committees, sent up resolutions to the National Gas Council. What is said merely means that there has been anticipation of wishes by action. Such resolutions as those that have been forwarded are a strong support to those who have been personally and unostentatiously taking the initiative in this matter. One of the resolutions puts forward the following as cogent reasons for movement being made in having a departmental inquiry into the position of the industry: "(1) The general position "of the gas industry arising out of the war; (2) The new "economic position in which internal and external developments have placed the industry; (3) the fact that "other industries are actively moving in the formulation "of a new policy in connection with the reconstruction "work of the country; (4) that Departmental Committees "have been considering the position of the electrical industry, and have presented reports which will, if legislation "follows on the lines of the recommendations, result in "preferential treatment being meted-out to the electrical "industry, to the disadvantage of the gas industry; and (5) "that no adequate steps have yet been taken to protect "the interests of the gas industry in connection with these "developments, or to define any lines of action that can be "pursued with a view, in the national interests, to take the "maximum possible part in the reconstruction period that "is approaching." Former articles in the "JOURNAL" have dealt at length with similar reasons; and we will not on this occasion reiterate the arguments.

But, in conclusion, let us say that all that can be done in whatever quarter in support of the movement helps to the end that is necessary to release the industry from the tram-

melling conditions which have grown about it, so that it may take its rightful place in the new circumstances that are being evolved, and may fight more freely and fairly and squarely in the new competitive environment that is forming. This end cannot be attained without the intervention of a Departmental Committee of competent constitution for this express purpose. There are too many things that are peculiar to the gas industry that require investigating to incorporate the inquiry in the work of a Committee designed to look into the affairs of other industries which have only relationship with the gas industry through coal carbonization, but which do not suffer the same trading and technical disadvantages by the action of statutory enactments that are out of date, and out of sympathy with the requirements of the times and with current knowledge.

Untimely and Needless Gas Strikes.

THERE have been strikes and rumours of strikes, just at a time when Britishers and patriotic men should be concentrating upon the one idea of securing the quickest possible victory over cultured brutality dressed up in human form. Though men may not be fighting, or may not be garbed in khaki or blue, their abstention from work may have a direct effect of value to the enemy, or it may have an indirect effect by hindering others who are engaged on work of importance to the war. When gas men strike, both effects are realized —the speed of the production of certain essentials for the war slows-down, and, if the supply of gas runs short, the work is seriously impeded of other people as well as of plant engaged on the manufacture of war material. Shame to gas men when such action is taken which could be averted! We cannot, for instance, find any excuse for the men of the Wandsworth, Wimbledon, and Epsom Gas Company and the relatively few of the Gas Light and Coke Company who went on strike last week just when brilliant victories have been achieved by their fellows on the Western Front.

The chief cause of trouble in the Wandsworth case and the sole cause of trouble in the Gas Light case were the same. But it was a matter that wise men would, if they could not have settled it peaceably now, have deferred taking extreme action upon to a time that was not harassed and stressed by war. But, most regrettably, the Wandsworth men thought otherwise, and those at one or two of the smaller stations of the Gas Light Company agreed. However, the dispute was very quickly composed, when Mr. Will Thorne, M.P., the General Secretary of the General Workers' Union, got into touch with it, with the men themselves, and with the Companies' directorial and official representatives. He took the real part of a leader—and just at this time at a great deal of personal inconvenience to himself—and did his level best to bring about a prompt settlement. This acknowledgment is fully due to him; and furthermore because, while naturally he has faith in the correctness of the principle that all forms of labour should be unionized, he at the same time believes in rules and regulations made by the men themselves, or endorsed by them, being loyally obeyed.

The matter that brought about the strikes was wholly one of principle. It was simply as to whether the unionist men should longer work side by side with a very small percentage of non-unionists, who, it was alleged, were enjoying that part of the benefits secured through the action of the Union, but were not subscribing to the Union funds the same as the other men. Had discussion between the men proceeded no further than this, there might eventually have been a peaceful transition from the state of non-unionism to that of unionism without recourse to extremes. But the unionists sought to impose a penalty of £1 per man in addition to the prescribed entrance fee of 1s., which includes book of rules, membership card, and the first week's subscription. This high-handed proceeding was not only renounced but denounced by Mr. Thorne, as in excess of authority and of lawful position. It was largely due to this, and to the facts that the two Companies have no care whether or not their employees are unionists, that there was quick composure of the trouble. We are strongly opposed to interference with the political freedom of any individual, and we are not believers in any form of compulsory conversion from one creed to another—whether political or religious. But when (say) well over 90 p.ct. of men in the employ of a company are unionists and the small remainder are non-unionists, then there is bound to be more or less constant or frequent friction; and, under such conditions, better for all the men to be members of the Union. Moreover, in view of the formation of Joint Industrial Councils, employers' organizations and employees' unions will be brought into intimate association. This fact will be favourable to the growth of unionism; and, whatever one's personal views may be regarding the rights of men as to political freedom, such growth must be anticipated. But if the Whitley proposals bring about all that is anticipated in the shape of good result, there will be no objection to this growth, especially if the unionists chose as leaders men of quality in mind and dealing. Given such leaders, and really statesmanlike work of the Joint Industrial Councils, the way for the future should be far easier for maintaining a more comfortable existence between capital and labour.

There is only one thing we fear about the incidents of last week in London; and it is that the opponents of co-partnership will attempt to make capital out of them. But if they remember the point already made, that the trouble was between the workers themselves, and not as between Company and men, they may hesitate to take a mean advantage of these particular incidents. They may also note that it was a perfectly clean strike, other than so far as it was a question of compelling unwilling men to become unionists. The men fairly said the dispute was not with the Companies; they did nothing to injure the property of the Companies in any way; on the contrary, they left men to keep up heats and to prevent accident; and the lamplighters in the Wandsworth Company's area were permitted to light-up lamps at dangerous points. This is all to the good; and it shows that beneath the surface there was friendship for and not antagonism towards the Companies. To men in similar case, we would say, "For the sake of the good name of gas "companies, for the sake of the good name of co-partner- "ship, for the sake of the good name of your unions, do "not allow such happenings again, particularly during the "continuance of this war."

The Prime Minister on Objectives.

WHAT the Prime Minister had to say at Manchester last Thursday is, apart from the information as to the excellent position regarding the war, full of hope and good promise respecting the future of the internal affairs of the country; and it fits with perfect harmony the aspirations that those who have the best interests of the gas industry at heart have formed and encouraged. But behind all the objectives that he visualized must be an enlightened, go-ahead Government—one that takes a larger concern than has been the case heretofore in the welfare of our home interests. Mr. Lloyd George does not appear to have touched on this point, which is fundamental to it all. We have had enough of politicians pure and simple—very simple some of them—and lawyers of various grades, who, in the main, have nothing of the business acumen about them that is as necessary to guide and drive the business of the counttry as for doing the like in a successful manufacturing and trading concern. The Government are impressed by the need of scientific research and the union of technical and practical training for the progress of industrial and commercial interests in the country. But apparently they are not equally impressed as to the need for a simultaneous looking to headquarters to see what reforms are necessary there. And one of the reforms is that men who have been thoroughly trained in industrial and commercial work should have a large part in the head work at Westminster. Till this is secured, industry and commerce will never get the requisite full measure of vigorous help from the Government of any day. A gift of eloquent speech-making does not necessarily show the qualifications of a good statesman; and the training of lawyers, when they are promoted to Government office, appears to lead (as the gas industry knows only too well) to an obsession of red tape and precedent. Acts speak louder than words; and we want to see parliamentary acts that are the outcome of individual and collective knowledge of the right sort. Every Committee of war-time appointment by the Government or any of its Departments has in its report produced some condemnation of the past policy of the Government in relation to home affairs, industrial and commercial. It has all been a brilliant panoramic reflection upon past dismal neglect.

The Premier spoke of the need for a healthier life—for better housing and education, and a continuation of higher remuneration of labour. These are, in his view, factors necessary to increased production, which in its turn is at

the root of the problem of the ability to meet the financial obligations which will arise from the reformation of our past ways, and to pay the costs of a war which has been an expensive schoolmaster. There is, too, the improvement of transport; the protection of essential industries; and the stimulation of agriculture. In all these objectives the gas industry is concerned as employers, and as having a large base and interest in the manufacturing and trading work of the country. It will also note with satisfaction the view that our national resources must be developed to the full, and that the State must render all assistance in its power for this object. All that has been written and said in the "JOURNAL" from the time of Lord Moulton's Presidential Address onwards, as to an investigation and presentment of the position of the gas industry, has its justification in this statement of the Premier. The industry has much to tell the Government as to the past, the present, and the future; and it wants it all carefully inquired into and the story compiled by men of competent qualification and repute. There is an earnest desire for the old statutory harness to be cleared off, and new harness put on. The time for patchwork has gone by; the Premier admits as much. His experience during the war has been the most educational that he has ever had. "I remember well," he says, "when "I was appointed Minister of Munitions, that I found there "were industries essential to national defence which had "been largely captured by our enemy. I am very glad to "say there does not seem to be any difference of opinion "among any party in the State that these essential key "industries shall be preserved after the war—not that we "anticipate another war, because we are less likely to have "another war if our enemies know we are quite ready for "any challenge on a just ground." The Prime Minister was then unquestionably referring to the dye industry, the materials required by which were needed urgently, but were largely in the possession of Germany, for making explosives for the Allies; and it was into this big breach in national defence that the gas and the coking industries were hurried to repair the then past neglect. These are both essential key industries. The gas industry, therefore, has a claim to consideration, and to new conditions to fit it for its part in the new world. Other words of the Premier can be adopted: "We want neither reaction nor revolution, but sound, well-"devised, and bold reconstruction." He spoke, too, of the necessity for making a beginning while there was still a spirit of fraternity prevailing. Let us stop here; for there is an abundance in these matters for very deep reflection on the part of the men of the gas industry.

Here-and-There Improvement in Coal Stocks.

IN some parts of the country, the efforts of the Coal Controller to increase supplies and their distribution are beginning to be felt; and coal is passing into stock with greater rapidity, though not at anything like pre-war rate, or that experienced in the summer of last year. But whether the rate of improvement will be maintained is a matter about which no one can speak authoritatively. Time is a great factor; and time is against the results from the efforts at stock-building being continued at their present levels, for darkening days and falling temperatures will absorb any increase in coal output that may be made. There will be those who will not feel any particular gratification over an improved position in which they themselves are not participating; for the improvement is not by any means general. The only satisfaction is that, if time and other conditions allow, the areas of improvement will extend. There is every assurance that Sir Guy Calthrop is keeping the gas industry well to the fore in his plans to meet the complex requirements. We can only hope for the best. What we have previously said in the way of criticism is adhered to. The only thing to be added on this occasion is that it would be some satisfaction to see the industrial coal economizing-scheme making headway, and to know that coal diversion and commandeering plans always took direction from non-essential to essential industries, and not from the essential to the non-essential industries.

Applications under the Temporary Increase of Charges Act.

A list published in a succeeding column shows the first applications to the Board of Trade and the Local Government Board under the Statutory Undertakings (Temporary Increase of Charges) Act. Excluding three water concerns, the gas companies applying to the Board of Trade number nineteen; and seven authorities have made application to the Local Government Board. The list, of course, is not quite up to date; but it will be remarked that it does not include all the promoters of Bills for relief this session, while several who were not promoters have early taken the opportunity of making applicatiou. Get the holiday season over, and it may be expected that, in view of all that has lately happened in regard to coal and labour costs, and the anticipated effects of the Fuel and Lighting Rationing Order, there will before long be a good spurt in the number of applications. Of course, it will be a case of "first come, first served."

The Tar Sale and Purchase Scheme.

The long drawn-out discussion between representatives of the gas industry and the tar distillers as to a new scheme for the sale and purchase of tar, has at last come to an end, and the scheme has taken definite shape. But before it is offered for final acceptance by the National Gas Council, meetings for the consideration and discussion of the details are to be held at various convenient centres in the country, on dates and at times and places announced in another column [see p. 527]. In this way, there should result something which may prove generally acceptable. Nothing positive can be said as to this until there is disclosure of the particulars; but the fact that the Sub-Committee (of which Sir Harold Boulton, Bart., and Mr. J. Ferguson Bell have been joint Chairmen) have arrived at an agreement, after having to overcome many impediments, gives good hope of, at any rate, a meritorious accomplishment. Mr. H. E. Ibbs will represent the National Gas Council at the various conferences.

Education of Adult Employees.

Among the reconstruction plans for the future is the extension of education. It is believed that, with the expansion of higher education among the masses, it will do much to give them a yet broader outlook and a fuller life; and that two of the results will be better unity between capital and labour, and the greater intelligence brought upon daily work will help to increase industrial efficiency. The schemes that have already been before the country include both elementary and technical education; but there are the adult workers who cannot hope to participate to any great extent in educational projects already in tentative preparation. This aspect of the educational problem has been under the consideration of a Committee on Adult Education appointed by the Ministry of Reconstruction, and presided over by the Master of Balliol. Their recommendations are of rather a striking order, as they do not propose the lines that study should follow, but only that work in industry should be so conducted as to afford reasonable opportunity for study. The Committee plead for such a reconstruction of the conditions of daily life and work as will afford men and women greater opportunities for satisfying that craving for education in its widest sense which is a permanent human need. We have not seen any unusual "craving" in the direction indicated; but this we do know that existing employees in industry will find the competition of younger and better educated, and therefore intellectually keener, men and women than themselves something that will require all the improvement that they themselves can bring to bear if they are to maintain their positions.

The Recommendations.

The proposals of the Committee are, as already said, directed to providing time for educational improvement, and are as follows: (1) A maximum legal working day of eight hours, with strict regulation of overtime and night work. (2) Effective measures to ensure reasonable security of livelihood, by guarding against and mitigating the effects of unemployment. (3) Reasonable holidays, with pay for wage-earners. (4) A comprehensive scheme of housing reform. (5) Reconstruction in the conditions of rural life. Excessive and irregular hours of work are specially pointed to by the Committee as tending to unfit workers for taking advantage of educational opportunities. The Committee seem to leave present adult workers to their own devices as to the lines of educational improvement that they should pursue; and seeing that educational improvement suggests present educational deficiency, they are not themselves the best persons to make choice. Furthermore, the existing educational opportunities are not usually those of which adults would care to take advantage. Fancy the man

of between fifty and sixty sitting down for educational purposes with the apprentice lad from the same works. Adult employee education demands the invention of a special scheme. However, there is here, if some practical scheme could be devised, a line of work which should bear good fruit in both the social and industrial walks of life. A phrase used by the Committee might be borne in mind by employers in turning this matter over in mind: "Industry exists for man; not man for industry."

STATUTORY UNDERTAKINGS (TEMPORARY INCREASE OF CHARGES) ACT.

Company and Local Authority Proceedings.

UPON inquiry, we learn that, up to the 12th inst., the following applications had been made under the Statutory Undertakings (Temporary Increase of Charges) Act, 1918.

Applications to the Board of Trade.

Alliance and Dublin Consumers' Gas Company.
Brighton and Hove General Gas Company.
Brynmaur and Blaina Gas Company.
Builth Wells Gas and Coke Company.
Cannock, Hednesford, and District Gas Company.
Comber Water Company.
Deal and Walmer Gas and Electricity Company.
Folkestone Gas and Coke Company.
Gas Light and Coke Company.
Horsham Gas Company.
Llanidloes Gas Company.
Long Melford Gas Company.
Quondon and Montsorrel Gas, Coal, and Coke Company.
Sheppy Gas Company.
South Metropolitan Gas Company.
South Suburban Gas Company.
Stroud Water Company.
Tadcaster and Wetherby District Gas Light Company.
Ventnor Gas and Water Company.
Wakefield Gaslight Company.
Westbury Gas Company.
West Gloucestershire Water Company.

Applications to the Local Government Board.

Filey Urban District Council.
Glastonbury Corporation.
Leeds Corporation.
Ossett Corporation.
Pontypridd Urban District Council.
Swinton and Mexborough Gas Board.
Wigan Corporation.

A Natural Draught Gas-Furnace.—The "Iron and Coal Trades Review" illustrates a natural draught recuperative gas-fired furnace made by the Incandescent Heat Company, Ltd., of Smethwick, on their new system, by which the combustion is perfected before the gases enter the working chamber. There are three burners on either side of the furnace, spaced 12 in. apart, delivering into combustion chambers of the Smallwood type. These chambers are proportioned to give the correct balance of the gases in the furnace chamber, passing through which the products of combustion exhaust from the front of the furnace—the pull of the flue being merely sufficient to guide the gases to the outlet. The perfect balance effected is, says our contemporary, evidenced by the fact that, even with the furnace-door left open, there is no inrush of cold air. In fact, there is a clearly defined line of the soaking heat right across the front of the furnace. Obviously, also, there is no stoppage of the process of combustion due to breakage of the flue-pull. Pure soaking heats are obtained, free from scaling; the atmosphere being neutral and non-oxidizing.

The Fuels of the War.—Part 212 (issued last week) of "'The Times' History and Encyclopædia of the War" deals with "The Fuels of the War." A very large part of the issue is occupied by putting on record, with consecutive precision, the principal events in connection with the work of the Coal Controller's Department—the various orders and regulations, together with the coal-redistribution scheme, having largely supplied the compiler with his facts. That the "part" is quite up to date is shown by the review of the last Fuel and Lighting Rationing Order. We see reference, too, to the task and proceedings of the Fuel Research Board, to the provision of liquid fuel by gas-works vertical retorts, and to the utilization of gas for road transport. But we should have liked to have seen a little more prominence given to the share that the carbonization of coal has had in the provision of high explosives and chemicals for the war, and a fertilizer for agriculture; so that the world might know how much the British gas industry has been called upon to do for the Allies, and how little reward has resulted at the hands of the Government. The part is extensively illustrated; and, being a sample of the parts that have preceded, it is clear that "'The Times' History and Encyclopædia of the War" will be a most comprehensive record of the very remarkable times through which, owing to the war, the world is passing.

OBITUARY.

The Rochester, Chatham, and Gillingham Gas Company have lost an old servant by the death of their Secretary, Mr. W. H. DAY, who had been connected with the Company for over half-a-century. He was 68 years of age.

The death has occurred of Mr. JOHN FULLARTON, who some eighteen years ago retired, after long service, from the position of Manager to the Motherwell Gas Company, whose undertaking has since been transferred to the Corporation.

Mr. F. A. DARLINGTON, who died last week in his 79th year, was Assistant Engineer to the Commercial Gas Company at Stepney as long ago as 1865, and subsequently became Resident Engineer and Manager to the Eastbourne Gas Company, with whom he remained until 1887. After this he took up commercial work in the City. He was an associate member of the Institution of Civil Engineers.

PERSONAL.

Mr. ANDREW HUTCHESON, foreman at the Port Glasgow Corporation Gas-Works, has been appointed as Gas Manager at Auchinleck, Ayrshire.

The Newtownards Urban District Council have accepted, with regret, the resignation of their Gas Engineer and Manager, Mr. W. H. ROBERTS, who has been compelled to retire through ill-health, brought on by overwork.

Mr. E. DAVIES is about to resign his position with the Birmingham Corporation Gas Department, having been appointed Power Supervisor at the Beckton works of the Gas Light and Coke Company, under the Engineer, Mr. W. B. Leech. Mr. Davies is a member of the Midland Junior Gas Association.

A special meeting of the Hebden Bridge and Mytholmroyd Gas Board has been held to consider the position of the Manager and Engineer, Mr. T. H. NIELD. It was stated that he had the offer of another post; and upon hearing this, the Board decided, in order to retain his services, to make fresh terms. These Mr. Nield has accepted.

Second Lieutenant HAROLD RAYNER, of the East Yorks Regiment, who, when war broke out, was an Assistant Gas Engineer at the Shipley Gas-Works, is posted as missing. He joined-up for active service as a member of the Leeds Artillery at the commencement of hostilities, and for a time served with the Royal Field Artillery. Twelve months ago, however, he was drafted into the Infantry, and then obtained a Commission.

Mr. HARRY WILKINSON, whose retirement from the position of Secretary and General Manager of the Harrogate Gas Company was notified in the "JOURNAL" a fortnight ago, has been the recipient of tangible proofs of the esteem and goodwill of his colleagues on the staff and the employees of the Company. Presiding at a recent gathering, Mr. F. H. Robinson (the Engineer and Manager) called upon Mr. Leithead, who handed Mr. Wilkinson a handsome drawing-room timepiece, a gold-mounted walking-stick, and a fountain pen, remarking that he did so with much pleasure, as an old associate of Mr. Wilkinson, and on behalf of the employees at the gas-works and the office staff. He said he was glad to have the opportunity of thanking Mr. Wilkinson for the many kindnesses extended to himself and others; and at this time he would also wish to remember Mrs. Wilkinson for the sympathetic interest she had at all times shown to the employees. Mr. A. I. Seaton (the new Secretary) then asked Mr. Wilkinson to accept, on behalf of his wife, an umbrella, with the best wishes of the employees. In doing so, he said that during the many years he had been associated with Mr. Wilkinson he had been impressed by his faithful and loyal service to the Company he had so ably managed. No man could have been more devoted to his duty. His whole care had been the interest of the Company and his subordinates; and he left with the respect and esteem of everyone. He asked Mr. Wilkinson to associate with those present the names of such employees as were serving their country, as well as a number of old and retired servants. Mr. Wilkinson, in accepting the gifts, remarked that the occasion was both a pleasant and a sad one. After nearly 54 years' service with the Company, the severance of the ties was no easy matter. He looked back with pleasure upon the loyal co-operation and support he had always received from the staff and employees. He tendered to all his hearty thanks, and the hope that they would enjoy good health and success. Mr. Robinson expressed the wish of them all that Mr. Wilkinson and his wife would have many years of health and strength in which to enjoy their well-earned retirement.

Wales and Monmouthshire District Institution.—The autumn meeting of the Wales and Monmouthshire District Institution of Gas Engineers and Managers will be held on Wednesday of next week, under the presidency of Mr. R. G. Clarry, who will deliver his Inaugural Address. Mr. F. Shewring, of Pontardawe, will read a paper on "Leakage and Main Testing." There will be a visit to the gas-works; and at luncheon and tea the members will be the guests of the Chairman and Directors of the Swansea Gas Company.

NATIONAL GAS COUNCIL.

Proposed Arrangement between Gas Undertakings and Distillers for the Sale and Purchase of Tar.

WE are informed that a Sub-Committee, under the Joint Chairmanship of Sir Harold Boulton, Bart, and Mr. J. Ferguson Bell, of Derby, consisting of tar distillers and of representatives of gas undertakings appointed by the various District Institutions and Associations of Gas Engineers and Managers have agreed upon a scheme which it is hoped will be found acceptable to the gas industry.

Before submitting the scheme to a meeting of the National Gas Council, it is proposed to hold meetings at certain provincial centres, so that the details of the scheme may be explained and fully discussed—especially the financial aspects.

The Council are glad to be able to announce that, by the courtesy of the District Institutions and Associations, the following meetings have been arranged, at which a representative of the Council (Mr. H. E. Ibbs) will be present:

NEWCASTLE-ON-TYNE, Gas Offices, No. 35, Grainger Street West, at 11 a.m. on Saturday, the 21st inst.

MANCHESTER, Midland Hotel, at 2.30 p.m. on Tuesday, the 24th inst.

BIRMINGHAM, Grand Hotel, at 2.0 p.m. on Thursday, the 26th inst.

BRISTOL, Gas Offices, Colston Street, at 2.0 p.m. on Wednesday, the 2nd prox.

LONDON, Holborn Restaurant, at 11.30 a.m. on Thursday, the 3rd prox.

POWER TO COMMANDEER COAL.

AN order has been made by the Board of Trade empowering Local Fuel Overseers to commandeer trucks of coal that may arrive at stations consigned to private consumers, and to use the coal in the public interest. The effect of this is that, where there is a shortage of coal in any particular district, and where truck-loads of coal are in transit to well-to-do people in that district, the Local Fuel Overseer may seize such truck-loads of coal and distribute them to meet the needs of the neighbourhood. This will ensure that those without coal, or those who have no facilities for storage, shall receive a share of any available supplies. The following is the Order.

The Household Coal (Requisition) Order, 1918, dated Sept. 7, 1918, made by the Board of Trade under Regulations 2 F and 2 JJ of the Defence of the Realm Regulations.

The Board of Trade, deeming it expedient to make further exercise of their powers under the Defence of the Realm Regulations as respects coal, hereby order as follows:

1.—All persons owning, or having power to sell or dispose of, coal to which the Household Fuel and Lighting Order, 1918, applies, and which has been, or is being, consigned in truck-loads to consumers, are hereby required to hold such coal at the disposal of the Board of Trade, and to deliver it if, and when, required to the Local Fuel Overseer for the area in which such coal may be.

2.—The compensation to be paid for any coal so requisitioned shall be determined, in default of agreement, by a single arbitrator appointed by the Controller of Coal Mines.

3.—This Order may be cited as the Household Coal (Requisition Order, 1918.

(Signed) W. F. MARWOOD,
A Secretary of the Board of Trade.

ECONOMY IN LIGHT, HEAT, AND POWER.

A Defence of the Realm Regulation, 11A, in substitution for the existing Regulation 11A, has been made in the following terms by Order in Council:

The Minister of Munitions, with a view to maintaining or increasing the supply of light, heat, or power for the purpose of the production, repair, or transport of war material or any other work necessary for the successful prosecution of the war, may

(*a*) by Order direct that lights of any specified class or description shall be extinguished or their use restricted to such extent, between such hours, within such area, on such premises, and during such period, as may be specified in the Order; or

(*b*) prohibit, restrict, or otherwise regulate and control the supply, or means of supply, of electricity to, or its use in, any premises or class of premises, or any place or undertaking,

And if any person having control of any light, or occupying or having control of, or managing, or being in charge of, premises in, on, or in connection with which any light is used, acts in contravention of any such Order as to lights, or if any person fails to comply with or acts in contravention of any Order or requirement hereunder as to the supply, or means of supply, or use of electricity, he shall be guilty of a summary offence against these regulations:

Provided that (i) this regulation shall not apply to any lights required to be kept lighted by a competent naval or military authority, or other officer authorized by him for the purpose, or under any Order made under Regulation 11 by the Secretary of State, or the Secretary for Scotland, and (ii) no Order or requirement shall be made for the closing of any power station belonging to any local authority or for the connection of any such power station with any other power station except with the concurrence of the appropriate Government Department; and if any question arises as to which Government Department is the appropriate Government Department, the question shall be finally determined by the Treasury.

ELECTRICITY SUPPLY MEMORANDA.

THE domestic heating season will soon be upon us. But in it electricity for this purpose will stand a poor chance of making progress; and it will only be those who are compelled to use radiators because they have no other means of heating a room who will do so at the prices now being charged for heating energy. Moreover, they will only be able to do so under the Rationing Order to the extent of 800 units per ton of coal discarded; and this will be fearfully expensive in comparison with gas. The 800 units of electricity represent 2,736,000 B.Th.U. Given 80 p.ct. efficiency, 2,188,800 B.Th.U. would be usefully employed; with a 90 p.ct. efficiency, 2,462,400 B.Th.U. Gas being rationed at 15,000 c.ft. per ton, this, at the standard 500 B.Th.U., would mean 7,500,000 B.Th.U.; and 75 p.ct. efficiency 5,625,000 B.Th.U. In other words, the largest quantity of heat that an electric fire would give to a room under the allowance would be less than 44 p.ct. of what the gas-fire would give. It is seen that in numerous places the total charge for electricity for heating purposes is now 2d. or 2½d. per unit. Take the former figure, the cost of the 800 units would be £6 13s. 4d.; and this, granting the electric-fire the very best efficiency, for less than 44 p.ct. of the heating value that the gas-fire would give, the householder using 15,000 c.ft., costing him, at the war-time price of 4s. per 1000 c.ft., £3. The cost of the gas on these terms would be less than half that of electricity, and yet it would put into a room twice the amount of heat. To get the same amount of heat from the electric-fire as from the gas-fire, more than four to five times the sum spent on gas would have to be expended on electric current.

The Ration and Current Heating Costs.

Fire and Cost Developments.

The electric-fire makers are not suggesting that there is anything in existence such as troubles over materials and labour, or that they are limited in production by the quantity of material they are permitted to use by the authorities. Nor are they suggesting that the electricity suppliers are only allowed to make extensions of consumers' installations by the graciousness of those who have in these days of control a veto on such business extension. Some of the makers are trying to induce themselves and the public to believe that business is going on as usual, and that the production of their appliances is being extended in a plethoric manner. The "Electrical Review" tells its readers with due gravity that the Arora Company, of Loughborough, Leicestershire, have found the demand for their fires develop so much since they started work in May, 1915, that the Company's erecting-shop has had to be extended to about five times the original floor space. But there is omission to tell the reader the extent of the original floor space. Again the information runs that the output for 1918 is likely to be three times that of 1917. The tale is, however, incomplete without knowledge as to the measure of the 1917 output. Judging from the availability of materials and labour, it can be with a fair amount of safety said that we should not fall down flat with surprise if the figures which represented the sum of three times the 1917 output were disclosed. However, we see that the Company have issued a leaflet describing two new "fires." One is a 750-watt one-bar fire for small rooms and kitchens—of course, the kitchens would also have to be small—and the other is a 4 KW. bar fire, which, going full blast on a cold day at 2d. per unit, would cost 8d. an hour for current, and 9s. 4d. for a run of fourteen hours, and bang would go, on a cold day, with continuous use of the radiator, 56 units out of the ration of 800 units for the ton of coal allowed for that room. We see that the fire-box, or the bar container, is interchangeable, and so can easily be incorporated in any of the Company's front castings of various finishes. This is one of the methods that gas-fire makers adopted several years since for extending the range of fires, and for limiting the variety of parts for maintenance that gas undertakings had to stock. The four-bar electric fire is nearly 2 feet in height and weighs 35 lbs. The pigmy one measures 10¾ in. by 4½ in. by 3 in., and weighs 7 lbs.

The Patrons of the National Kitchens.

In the "Memoranda" last week, and in another part of the "JOURNAL" the week before, the "National Kitchen Handbook" was noticed. The contributor to "Heating and Cooking Notes" in the "Electrical Times" has since devoted some space to it; but, when writing, it was not within his knowledge that the Coal Controller, being now a baronet, is entitled to what those who are not socialists and democrats regard as a more dignified title than "Mr." Guy Calthrop.

However, that by the way. It is observed in the review of the "Handbook" that, while the middle classes are patronizing national kitchens and restaurants, and are demanding more of them, the so-called working classes are not taking anything like full advantage of their possibilities. If this is so, it is quite an inversion of the original intention of the National Kitchen. But newspaper writers must not make general judgment on the evidence of the Bridge Street National Kitchen and Restaurant, because it is situated not in a residential, but in a business district; and this accounts largely for the class of people who are seen patronizing it, and often helping to form a pretty long queue. In such an area the "working-class people" employed in the neighbourhood probably provide themselves with a midday meal from the cupboard at home, and find this cheaper, having regard to quantity, than they would secure from the National Kitchen at even the prices charged there. We doubt if the assertion would apply in a residential area that it is the middle class who make National Kitchens a success, which all of them are not, for there are some that have been closed for the summer months. The "Evening News" has essayed an explanation of the failure of the working classes to support the National Kitchens. The explanation, we gather, is that there is an impression among the poorer classes that to eat food prepared in a National Kitchen imposes some sort of social stigma. On the other hand, while the middle classes see in them a means of escape from servant and fuel problems, and from overcharges at restaurants, poorer people, not accustomed to restaurants, and regarding the national variety as glorified soup kitchens, will not support them. We do not believe that this is at all the reason. The middle classes do not see in them a means of escape from servant and fuel problems. Our observation does not disclose that husbands and wives and children flock to these places. It would not take many families to fill one of them; so that the servant and fuel problems remain problems still. And as a general means of living for the working man and his family, the National Kitchen would only, excepting for occasional patronage perhaps, add to the complexities of life—especially at the present time. Such kitchens will never gain the day-by-day patronage of large working-class families. Did they do so, the next problem would be that gigantic National Kitchens would soon be required. Consider the population in relation to the output of the National Kitchens. The immensity of a local population in a London area makes the output of the National Kitchen something of very minor appearance. We do believe, however, that one advantage of the National Kitchens will be to bring some of the ordinary caterers to their senses, if, in consequence of them, they find their custom diminishing. For, in some places, quality, quantity, and price have jointly made departure from anything which can claim to be within the bounds of reasonableness even for war time.

Waste Heat a Bye-Product.

The electricity generating stations are at a grave disadvantage in that, as users of coal, they have no bye-products. Hence the feverish anxiety in some quarters to enter upon the carbonization of coal in order to have something marketable with which to reduce the net cost of fuel. In a recent article in the "Electrical Review," Mr. W. H. Booth argues in favour of an attempt being made in the direction of utilizing the waste heat from the condensing water. He shows this waste is a considerable amount, even when he utilizes for illustration the low figure of 1·54 lbs. of coal per H.P.-hour electrically delivered at the consumers' terminals, taking the coal value at 14,000 B.Th.U. per pound. As the average consumption of coal in the country per electrical H.P.-hour is more than double this, his figures apply only to not yet attained ideal conditions. The consumption of 1·54 lbs. would represent 21,560 B.Th.U. per terminal H.P.-hour. He assumes that one-fifth of this would be lost up the chimney, and that the heat in the steam would be 17,248 units, and the heat in the condensing water 13,800 B.Th.U.—that is to say, 20 p.ct. of the steam has been converted into electrical energy. Mr. Booth seems to have made a slip here by calculating on a KW.-hour instead of a H.P.-hour. However, taking his figures for the illustration, they show that the heat in the condensing water, under the conditions mentioned, is equal to 64 p.ct. of that of the original coal. In the case of gas-engines, the coal consumption would not amount to more than about 1 lb. per terminal H.P.-hour, seeing that the efficiency of the producer should exceed that of a boiler. The efficiency of the gas-engine, if not yet more than 25 p.ct. or thereabouts, may be anticipated to become 30 p.ct. But there would still be some 9200 B.Th.U. of waste heat per terminal horse power, divided between the exhaust gases and the jacket water. Mr. Booth asks, Is this vast amount of heat to be saved? The problem of saving the waste heat is apparently one, in his opinion, which puts the big power station out of consideration, if the enormous amount of waste heat can be usefully conserved. However, his point is that, given a means of so arranging electricity supply that waste heat could be furnished to all households concerned, it would seem that, on a sound system of heat distribution within a limited radius, an enormous fuel economy would be secured; for the great fuel consumers are the fires in the living rooms and the kitchen range. Real economy, in his view, would result from a central communal heat supply; electricity would be a secondary product to heat, or might easily become so; and one result of this would be that simpler and cheaper machinery might be used in the generating stations. With the super-station, the present wasteful domestic fuel problems would continue.

Considerations.

This sounds all very nice; but Mr. Booth has omitted to deal with the capital costs of heat distribution on these lines, and with the heat losses. We know that it is claimed that water can be transmitted in a 12-in. main, suitably lagged, at a temperature of 100° Fahr. above ordinary temperature at the rate of 3 linear feet per second, with a loss of 1·65 to 3·3 p.ct. of heat per mile, giving a total loss of 6·6 to 13·2 p.ct. over a 4-mile radius. "Suitably lagged" is a term of very flexible meaning; the efficiency of the lagging being in proportion to the expense incurred on the insulation. Moreover, the demand for hot water is intermittent in a household, and varies considerably with the seasons and the time of day. Heating rooms by steam or hot water is also a poor substitute for the live fire in winter time, and would not largely meet the notions of comfort of the average Britisher. Again, heating by convection or conduction is not such a healthy mode as heating by radiation. We are to sacrifice all this for the prosaic end of doing a good turn to the electricity generating station; but householders cannot be forced to adopt any particular means of heating. There are many more things to be considered than the saving of the waste heat in the manner proposed—admirable though the effort is to produce fuel conservation by any and every means. Not that the points here raised finally dismiss as impracticable the problem of utilizing this form of waste heat. There are no doubt many uses to which it could be put in an ideal arrangement—say, of local industries where they are grouped round the gas-works and the electricity station. But then it might be that the gas-works would develop into a power-gas supply station—producer gas being made from coke; and the manufacturers requiring electricity and heat might then find it preferable to generate the former themselves, and obtain heat by gaseous means when and as they desire it, and use it in quantities regulated to their temperature demands, which would not be the case under Mr. Booth's low-grade heat plan. In "Engineering Notes" in the "Daily Telegraph" recently, it was stated that, in a lecture at Charlottenburg, an example was given of the utilization of waste heat from an electricity generating station, by the distribution of the heat to 300 workmen's dwellings, which meant an estimated annual saving of 3000 tons of fuel. This appears to be an exaggeration, as there are not many workmen's households that use an average of 10 tons of coal a year—at any rate in this country.

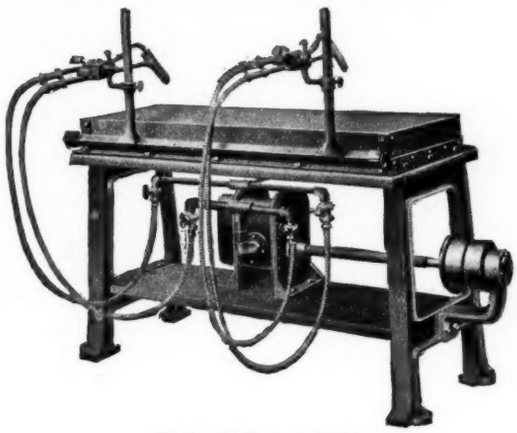
Automatic Heat-Treating Furnaces.

It seems that at the beginning of the war various furnace-builders in the United States, realizing the development that the heat treatment of shells, was about to undergo, and being aware of the inadequate number of skilled operators in the country, independently endeavoured to produce automatic heat-treating machines. Difficulties have, however, been experienced, mainly in the handling of large shells. Careful experiments resulted in the development by the Surface Combustion Company (New York) of an automatic furnace of the kind desired; and it has been described by Mr. W. J. Harris, Jun., in the "American Gas Engineering Journal." The high-pressure gas-burning system is used, with a rotary compressor and suitable air and gas mixing arrangements. The burners are of the "impact" refractory bed type. The shell rolls through the furnace on cast-iron forms, which are made in short sections, so as to be easily renewable, and to avoid distortion. The forward motion of the shell is accomplished by means of a row of cast-iron plungers operated by suitable mechanism located beneath the furnace. The burner control is so simple that an experienced operator can easily hold the temperature with a limit of 5° Fahr. from the desired point for practically any length of time. The shell being supported above the hearth on the cast-iron forms, and resting on two small points, enables the heat to reach all parts of the shell. This eliminates the necessity for keeping the hearth of the furnace above the desired temperature. The mechanism is so arranged, too, that the shells are almost continuously in rotatory motion, which, along with the fact that they are kept about 2 in. apart, ensures the utmost uniformity of heating. Each shell revolving over the entire length of the furnace at the same rate of speed is thus subjected to the same heat conditions. Owing to the continuous revolving motion of the shell, and the fact that it rests above the hearth, the rapidity of the heat absorption is greater, thus reducing the length of time required to heat the shell thoroughly and uniformly. In one furnace, the shells were treated at the rate of 50 per hour at a temperature of 1500°, and required only 5000 c.ft. per hour of 530 B.Th.U. town gas. The weight of the shells being 95 lbs. each, it is pointed out that this corresponds to a thermal efficiency of over 45 p.ct.

Messrs. Ferree and Rand have described in the "Procedings of the American Illuminating Engineering Society," some experiments to test the effect on the eye of different illuminants. They include various electric incandescent lamps—carbon, tungsten, tungsten with blue bulb—and a kerosene lamp. The results are plotted in terms of "time clear to time blurred," to indicate the degree of fatigue. The results suggest that the colour is an element of some consequence. The loss of efficiency of the eye, on the above criterion, was least with a tungsten lamp giving a white light, greater with a carbon lamp and a kerosene lamp, and highest with the lamp with a blue bulb.

A SELF-CONTAINED BRAZING OUTFIT.

SPECIALLY suitable for the aeroplane industry and certain tool-makers' work is a self-contained gas-fired brazing table, which is being made by the Davis Furnace Company, of Luton. Among the more important advantages attaching to the use of a gas-fuel outfit of this description, may be mentioned ease of manipulation, as the apparatus is ready for operation immediately the work is laid upon the table; exact control of temperature and the area to be heated; and cleanliness, with consequent improved quality of the work turned out. Another point is that the work is in clear view during the time the operation is in progress.



The Davis Brazing Table.

The particular size of brazing outfit shown by the engraving has a fire-brick table measuring 3 ft. 10 in. by 1 ft. 6 in. This table is mounted upon a cast-iron stand, provided with a lower (or bracing) shelf; a high-pressure blower being fixed on the latter, complete with fast-and-loose pulleys, or alternatively a small electrically-driven machine, for providing the air-blast required by the blow-pipes. In this case, two blow-pipes are provided, with a $\frac{7}{16}$-in. nozzle, a 1 in. diameter head, and 19 in. long. Each blow-pipe is swivel-mounted on a pillar, with suitable adjustment for height. Instantaneous lateral adjustment is provided by the vertical supporting pillars sliding on a machined bar of square section, fixed horizontally along the front of the table. There is flexible metallic tubing, with separate main control cocks, for the gas and air supplies.

STANDARDIZING REFRACTORY MATERIALS TESTS.

AT the fourth meeting of the Refractory Materials Section of the Ceramic Society, which took place at Sheffield last May, Dr. J. W. Mellor presented Part I. of the report of the Special Committee on the Standardization of Tests for Refractory Materials. This report, the heads of which were given in the "JOURNAL" at the time [May 21, p. 332], was adopted, with a recommendation that it should be submitted to the Iron and Steel Institute. This was done last week, in London, when the report was laid before the members with the following introduction by Mr. Cosmo Johns.

Progress in the improvement of refractory materials can only be slow and uncertain, if the only available test of their efficiency is that of behaviour under service conditions. This must, of course, be the final and conclusive test; but the use of refractory materials for metallurgical and other structures can only be said to be placed on a scientific basis when their desired properties can be specified and tested in measurable quantities. This involves a knowledge of methods of testing; and in the case of transactions between the maker and user, there should be agreement as to the methods of testing to be employed.

In the gas industries considerable progress has been made, and specifications have been drawn up for the principal refractories employed. In the present state of knowledge, this is not possible for the more exacting requirements of metallurgical structures, where much higher temperatures obtain, and corrosive slags and dust-laden gases moving at considerable velocities add to the difficulties of the metallurgical engineer. Before this can be achieved for the iron and steel industries, much more must be done in measuring the properties of the various materials available. In order that this might be facilitated, a Committee* was appointed to draw up a report on the Standardization of Tests for Refractory Materials by the Refractories Section of the Ceramic Society. Their report was adopted at the Sheffield meeting of the Section, with a recommendation that it should be submitted to the Iron and Steel Institute for discussion and criticism. The report now appears with this communication, with the object of enabling the members interested to criticize, approve, or suggest revisions where their experience indicates the desirability.

The method suggested for the analysis of the acidic materials is well known; and it is not expected that any revision will be suggested. But there is a feeling that the method given for the analysis of dolomite and magnesite might possibly be susceptible of useful revision. Any constructive criticism in this direction would receive careful consideration by the Committee. The ultimate analysis of any refractory material is, however, of only limited value; for refractories used in industrial operations are never pure substances, and it is the concentration of certain constituents that largely determine the refractory value of the material. Hence it is largely in the direction of physical tests that we must look when we desire to determine the suitability of refractories for the purpose intended. The leading manufacturers have of late paid considerable attention to these methods, and a large amount of data is being accumulated. It is very desirable that users, especially those operating on a large scale, should, having regard to the importance of the subject, interest themselves in the problem. The failure, or shortened life, of a metallurgical structure—such as a blast-furnace, coke-oven, or open-hearth furnace—owing to unexpected variations in the quality of the refractory materials employed, is a serious matter; and the consequential losses are out of all proportion to variation in the cost of the refractories themselves.

The physical tests described in the Appendix are simple; but they require, if the results obtained are to be comparable with those of other workers, the use of suitable apparatus, and a knowledge of the principles involved. In the case of silica and siliceous bricks, it is sometimes useful to know the particular form in which the silica occurs. The method described by Dr. Thomas is the only reliable one available. Less reliable methods are probably responsible for the contradictory determinations recorded in the literature of the silica minerals. It is questionable, however, whether a determination of the quartz, tridymite, and cristobalite ratio in a silica brick would, in the present state of knowledge, enable us definitely to attribute a figure of merit to the brick under investigation.

The porosity, shrinkage, and tensile strength tests require no comments; but the determination of volume changes, normal refractoriness, and crushing strength at high temperatures, involves the important question of temperature determinations and rate of heating employed. The Committee recommend, in each test, the use of Seger cones, and state explicitly the desired rate of heating. Seger cones, like the materials under test, have no distinct fusion-point, but a considerable softening range. A silica brick does not fall by complete fusion of the overheated portion, but by the selective fusion of the matrix, in which the larger silica fragments may be observed unaltered. In the course of normal wear, the heated surface becomes almost homogeneous at the high temperature employed; both matrix and aggregate having formed a solution. In most refractory materials, it is the refractoriness of the matrix or bond that determines its usefulness. As the temperature at which failure occurs depends on the rate of heating, this factor requires careful attention. In the case of normal refractoriness, the weight of opinion leans to the use of Seger cones as temperature indicators, but expressing the refractoriness in Seger cone numbers and employing a defined rate of heating.

The present writer has, however, suggested that in the refractory test under load, having regard to the extreme value of the data sought for, the actual temperature should be determined. The data required are expressed as the strain under a particular stress at a definite temperature; and for this the use of pyrometers would be necessary. The same might be urged for determining the thermal or reversible expansion. We have here obvious cases where there is room for differences of opinion; and constructive criticism would be welcomed.

Eventually, it is hoped that knowledge will have progressed sufficiently for the drawing-up of specifications for the more important refractory materials used in the iron and steel industries to be undertaken. Such specifications, when agreed upon and based on exact methods of testing, would be welcomed by the leading makers; but their preparation will be a matter of considerable labour, and will require the closest association of qualified representatives of both users and makers of refractory materials, and the assistance of experienced workers who have specialized in the scientific side of the subject. Most fortunate would it be if this could be done under the auspices of a National Association for Refractory Research in which this Institute was represented.

DISCUSSION.

Mr. JOHNS, in introducing the paper, asked the members to criticize the report as fully as possible. There was a reason for deciding, if only tentatively, standard methods of testing the properties of refractory materials. A considerable amount of progress had been made by more than one British manufacturer. A new clay had been discovered; and certain makers were prepared to use it. He had seen fire-bricks made from this clay which were better than any silica bricks he had come across. He was glad he could report progress, and that all the leading manufacturers of refractory materials in this country were earnestly at work endeavouring to produce a better material.

Prof. T. TURNER pointed out that the simple tests recorded in the paper were practically the tests that had been used for the past twenty

* The members were Prof. Cobb, Dr. H. G. Colman, Major C. W. Thomas, Messrs. F. H. Brooke, W. J. Brooke, A. Cliff, J. Allen Howe, Cosmo Johns, W. J. Jones, B. Moore, D. J. Pinkerton, W. J. Rees, and Dr. J. W. Mellor (Hon. Secretary).

or thirty years; and it was well that they should be placed before those who were interested in the subject. As to tensile tests of clay, he attached very little importance to these, as they were only occasionally made. He preferred a crushing test, though too much attention could be given to this. It was important, of course, to know occasionally what was the crushing strength; but nobody dealt with a single brick, except in testing. There was usually some jointing material; and then the strength of the brickwork was much less than the strength of the bricks. Often the crushing strength of brickwork was less than one-third the crushing strength of the bricks; and with such a large margin introduced by the bonding, the question of the crushing strength was not very important. The electric furnace and pyrometer was the best method of testing refractories, when a well-equipped laboratory was available. At the same time, it was possible in a simple manner to determine the qualities of refractories without the use of pyrometry. One test not mentioned in the paper ought to be called attention to—the transverse test. This was connected to some extent with the tenacity and crushing strength; and in dealing with different kinds of clay, and the effect of different quantities of grog, he found this test very suitable. It was one of the simplest for those works which required quantitative values without expensive apparatus.

Dr. J. E. STEAD thought it was advisable to use larger quantities than half-a-gram for testing purposes. He invariably used two grams, because the chances of error were very much lessened.

Mr. H. M. RIDGE, who expressed his interest in grog bricks rather than in magnesite or silica bricks, said he had been using these with grog up to $\frac{3}{8}$ in. and $\frac{7}{16}$ in.; and it was impossible to use the suggested standardized tests with grog of this size. The paper suggested that the test-piece should be cut from a brick and ground to a rectangular block $3\frac{1}{2}$ in. long and 2 in. cross-section; but as there was practically a standard brick in this country, 9 by $2\frac{1}{2}$ by 3 in., was it not possible to test the whole brick? The test proposed was one of the whole fire-brick under working conditions, because the cutting-out of the test-piece caused a good deal of destruction of the texture and of the skin. At present makers and users who had facilities were carrying out a large number of tests, which were carefully filed away. Was it not possible for the Research Committee to arrange that the results should in some form or other become public property? If makers would only scrap the policy of secrecy, better progress would be made. The bonding material used for building-up furnaces required serious consideration. The fire-brick maker invariably said that raw clay was the best bonding material; but he did not always agree with this. Therefore, when standard tests were set down, they should include tests also for the bonding material. There would have to be separate tests for raw clay, and for raw clay with other materials added.

Dr. WALTER ROSENHAIN thought the tests proposed to be adopted as standard were rather in the nature of a compromise between what really ought to be two distinct types of test. There should be two distinct and separate sets of tests—one for everyday routine in cases where methods of refinement were not available, and the other for use in the great laboratories where every refinement should be available, and where there should be the highest possible degree of accuracy. A small test-piece, if cut carefully, might give a reasonable representation of the general refractoriness and strength of a brick; but undoubtedly the right test was to test the whole brick or, better still, a piece of brick-work built-up. This required resources of furnaces which were not available in the ordinary works testing laboratory.

Dr. J. S. UNGER (of Pittsburg, U.S.A.) said that, though a lot of testing of refractory materials had been done in America, he had long felt that a great many of the tests did not really give information of much value to the user. The chemical analysis of a brick, for one thing, only indicated its quality in a general sort of way. He had seen bricks of practically identical chemical composition; and one was very good, while the other was very bad when put to work. He had found, too, that there was a distinct change in the chemical composition of a brick after it had been in use in a blast-furnace for five years; and if the brick altered so rapidly, the original chemical composition was not of much value. He had adopted a spalling test with silica fire-bricks—heating the brick up to the working temperature, and then rapidly cooling it. After a prescribed number of heatings, all loose material that could be removed by hand was removed, and the brick weighed, and its loss determined. This loss he found varied from 9 to 40 p.ct.; and it seemed to him that a spalling test was necessary in actual service. The same might be said of the crushing test. Too much work might be carried out on tests that were of theoretical value. A test that closely represented service conditions gave more useful information. Most knowledge was obtained by testing the bricks regularly as they came from the brickyard, and not a few bricks at rare intervals. So many bricks out of every thousand should be tested in a way that would imitate service conditions as closely as possible. There had not been the improvement there should have been in the manufacture of bricks; and though a number of experimenters were working on the problems of refractoriness, they were not attacking it the right way.

The PRESIDENT (Mr. C. P. E. Schneider), in bringing the discussion to a close, said it was possible the matter would come up again at the next meeting.

Cost of Manufacturing Calcium Carbide.—According to Mr. C. R. Darling, to manufacture a ton of calcium carbide involves a consumption of 4000 kilowatt-hours, the cost of which at the hydro-electric installations in Norway is about £1 5s.; whereas the fuel costs in this country, even in a good power-station, are about 0·35d. per unit, or £5 16s. per ton of carbide. This difference, after allowing for freights and other costs, is sufficient to throw coal-generated electricity out of competition for producing carbide. Mr. Charles Bingham has pointed out that the surplus gas from blast-furnaces and coke-ovens, over and above that which can be utilized for various purposes on the spot, amounts in the aggregate to a very large quantity. If, therefore, the carbide furnaces could be established in proximity to blast-furnaces, power should be obtainable at a rate sufficiently cheap to enable carbide to be produced economically in this country.

SOME APPLICATIONS OF SILICA.

The Cantor Lectures last winter of Mr. C. R. Darling, which were briefly noticed in the "JOURNAL" at the time of their delivery, have now been printed in full in the "Journal of the Royal Society of Arts." The subject of the series was "High-Temperature Processes and Products;" and in the third lecture, much attention was paid to silica.

Mr. Darling explained that, when rock-crystal or sand is heated to fusion, and allowed to cool, it remains in a vitreous condition, and then posseses properties resembling those of glass. Vitrified silica thus prepared softens perceptibly at 1500° C., but is not completely melted until nearly 1800° C.; and while in the plastic state it may be drawn out and blown in the same manner as glass. The remarkable quality of vitreous silica, whereby it may be quenched in water from a white heat without cracking, led many workers to attempt to produce it cheaply by using a pure form of sand. Practical success was first achieved in this country by the Thermal Syndicate, at their Wallsend works; an electric furnace being employed to melt-up sand that contained 99 p.ct. of silica. Vitrified silica, from the chemical standpoint, possesses the valuable property of being proof against acids, with the exception of hydrofluoric, and phosphoric above 400° C. This fact, combined with its capacity for withstanding changes of temperature, has enabled it to replace with advantage porcelain and earthenware in industrial chemical processes. A further advantage of silica ware is that it is non-porous. It is attacked, however, by alkalies, either fused or in solution.

In the laboratory, silica apparatus, either of the transparent or semi-transparent type, is much used instead of glass for various kinds of vessels and combustion tubing; in cases where heat-resistance is of importance; and as a substitute for porcelain in crucibles, basins, combustion boats, &c., as unlike porcelain, it is not liable to crack on sudden heating. Practically all glass apparatus may be reproduced in silica. Silica sheaths are largely used for protecting the wires of pyrometers; and not being penetrated by furnace gases, they are well suited to this purpose. Silica, however, if heated for a long period above 1200° C., undergoes devitrification, and is liable to weaken and crack; so that its use in pyrometers is restricted to temperatures below 1200° C., except for occasional readings.

Another useful application of silica has been found in connection with lighting, as a substitute for glass in chimneys and bulbs. The semi-transparent variety is employed to surround gas-mantles; the chimneys being of less diameter than would be permissible with glass. The result is that the mantle becomes hotter and more luminous, and the light is softened by passing through the material. There are many other instances in which vitrified silica may be used to advantage; and there is little doubt that its use will extend as improved methods of production bring about an accompanying reduction in cost. The gratifying fact that this country has always been to the fore in the production of silica ware is due to the enterprise of the Silica Syndicate, who have specialized in the clear variety, and the Thermal Syndicate, who have produced the cheaper form under the name of "Vitreosil."

DETERMINATION OF NAPHTHALENE IN TARS AND TAR OILS.

This subject was dealt with by Dr. Oscar Knublauch, of Coln-Ehrenfeld, in the "Journal für Gas Beleuchtung," Vol. LXI., pp. 134, 145; and an abstract of the articles appears in the last issue of the "Journal of the Society of Chemical Industry."

The author's method of estimating naphthalene by direct titration of the picrate with standard alkali has been adapted to the analysis of tars and tar oils. The precipitation is effected with both the sample and the picric acid in alcoholic solution. After mixing, the solution is diluted with water; and the precipitation is complete if the resulting solution contains not more than 10 p.ct. of alcohol and at least 0·2 p.ct. of picric acid or less than 12·5 p.ct. of alcohol and at least 0·3 p.ct. of picric acid. The quantity of picric acid must be chosen to ensure these end concentrations without the precipitation of free picric acid.

Crude Naphthalene and Tar Oils.—A quantity containing from 0·1 to 0·2 grm. of naphthalene is weighed into a 200 c.c. conical flask. Then 15 c.c. of absolute alcohol is added, and picric acid equal to two to two-and-a-half times the weight of naphthalene. The flask and contents are heated to 60° to 65° C., until all is dissolved; cooled; and the volume made up to 120 c.c. with a 0·3 p.ct. aqueous solution of picric acid. After an hour, the precipitate is collected on a 10 cm. smooth filter, and washed with a 0·2 p.ct. picric acid solution. The paper and contents are transferred to a small beaker with 50 to 80 c.c. of water and titrated with $N/10$ caustic soda, using methyl orange as indicator—a deduction of 0·2 c.c. being made for the picric acid retained by the paper and precipitate. Phenol does not interfere. The results with pure naphthalene were quantitative.

Tar.—The quantity taken should contain about 0·07 grm. of naphthalene (the proportion of picric acid as above), but in no case more than 0·6 grm., so as to avoid precipitation at the end. In the case of viscous tars, the sample is weighed into a small

beaker, and the picric acid dissolved in 15 c.c. of alcohol added. After heating the beaker and contents to 60° to 65° C., the tar is carefully extracted by stirring and working with a glass rod for at least thirty minutes. When cold, 15 c.c. of water and 120 c.c. of 0·3 p.ct. aqueous picric acid solution are added. Leaving the tar residue in the beaker, the picrate precipitate is transferred to a filter, and the determination continued as above. Tars containing much light oil and little naphthalene give unsatisfactory end-points; and in such cases the picrate precipitate is decomposed by an excess of *N*/10 caustic soda. The liquid is washed with hot water into a small beaker, and then filtered into a conical flask. From 5 to 6 c.c. of a neutral solution of an ammonium salt is added; and the ammonia liberated is determined by distillation into a measured volume of *N*/10 sulphuric acid. When the filtration of the picrate is difficult, the tar is extracted with 15 c.c. of a solution of picric acid in alcohol; the extract being poured into a conical flask. Further extractions are made with 35 c.c. of alcohol, and the washings added to the first, leaving the tarry residue behind. Of the alcohol, 35 c.c. is removed by distillation, and the determination of the picrate continued as described.

Light Oils or Tar Oils.—It is necessary to remove a portion of the light oil before precipitation. The oil taken is treated with the picric acid dissolved in 25 c.c. of alcohol, and a portion of this is distilled off. After cooling, the 0·3 p.ct. solution of picric acid is added, so as to dilute the alcohol ten times; and the determination is completed by one of the methods described. The volume of alcohol distilled and the weight of picric acid taken must be chosen so that the end concentrations are appropriate.

A "Grasshopper" Relief Holder Connection.

There is illustrated in "Gas Industry" [New York] an emergency "grasshopper" connection feeding a relief holder belonging to the Union Gas and Electric Company at Bloomington. It is explained by Mr. Ray Stretch that the demands of the service had outgrown the capacity of the original inlet connection to the holder, to an extent that was seriously interfering with the work. It was causing back-pressure of the plant, and, of course, reducing the capacity of the generator. Hence the installation of the "grasshopper" connection. A new line was run from the generator-house to the edge of the relief holder; but in order to instal the inlet to the holder in the usual way, it would have been necessary to take it out of service for several days and drain the tank, so that the pipes could be put in place. As, however, the use of the relief holder could not be dispensed with even for a fraction of a day, other means of making the connection had to be employed; and the problem was solved by the "grasshopper" connection. An opening was made in the top of the holder, to which a special swinging fitting was attached, and connected with the pipes. The design of the "grasshopper" called for a counterweight to relieve the crown of the holder of the weight of the pipe. The entire arrangement is giving great satisfaction.

British Supplies of Potash.

In 1913, the last complete year before the war, the total sales of German potash amounted to 1,110,274 metric tons, the estimated value of which was £10,100,000. In the same year, potash salts to the value of £1,380,567 were imported into Great Britain; the German contribution to this being over £915,867. These figures are taken from an article in the "Board of Trade Journal," in which it is shown, by means of a diagram, how enormously the imports from Germany predominated; the balance of it being obtained in small quantities from many sources. With most of this great import stopped, it is pointed out, the Ministry of Munitions found themselves face to face with a very serious problem. To cope with the position, a new department of the Ministry—the Potash Production Branch—was formed, and commenced work armed with the results of some very valuable experiments carried out by Mr. Kenneth M. Chance, a Director of the British Cyanides Company, Ltd., and Mr. Lennox Leigh, on the production of potash as a bye-product in blast-furnace working. After much labour, Mr. Chance developed his idea that the addition of a small proportion of common salt (chloride of sodium) to the charge of the furnace, would release the potash present in the ore, and cause it to be volatilized with the emerging gases as potassium chloride. As the result of large-scale experiments, it was estimated that it would be possible to recover by suitable means a maximum of 50,000 tons of potash salts per annum from blast-furnace dust alone—practically enough to meet the needs of the country. The cost of its recovery may be regarded as negligible. Clean gas—the main product of the necessary installation—is in itself valuable; and the cost of removing the impurities is therefore chargeable to the gas. The chief item of cost entirely chargeable to the potash is the value of the small amount of common salt added to the furnace. To deal with the process, the British Potash Company was formed, one-half of whose shares are held by the Government. At the same time, other possible sources of supply have by no means been neglected.

American Illuminating Engineering Society.—The Illuminating Engineering Society of America will hold their annual convention in New York on the 10th prox. War-time lighting economies, the use of better lighting in speeding-up war production and manufactures, the lighting of camps, and the effect of lighting curtailment on crime, will be among the subjects discussed.

EXPERIENCES WITH TAR OILS FOR POWER.

There have been references of late in the electrical papers to the use of tar oil for engine use. In a recent article in the "Electrical Review," a writer dealt with the question of tar oils as motor fuel. Difficulties, of course, have been met with; and somewhat refined methods have had to be devised to overcome them. But the article is composed of favourable testimony as to the use for motor car purposes, given a proper though quite simple fitting for the purpose. The article states that tar oil costs 5d. per gallon, while before the war it was only 2d.; but petrol costs now 3s. 9d., *plus* tax. The experience as to running was derived during a trip on a car fitted with a four-cylinder petrol engine, which had undergone simple conversion to enable a change of fuel to be made. During the trip it ran for a time on coal gas and then on tar oil—the change from one fuel to the other being scarcely perceptible. The car has run 7000 miles in two years on paraffin, and for three months on tar oil. The following results show that with the same quantity of fuel, the mileage run is practically the same; but the cost of the fuel is vastly different:

	Sp. Gr.	Flash Point.	Cost of Fuel.	Miles Per Gallon.	Cost. Per Mile.
Petrol	0·745	—	3s. 9d.	19·61	2·29d.
Paraffin	0·810	—	1s. 9d.	18·76	1·11d.
Tar oil	1·015	184° F.	5d.	18·33	0·27d.
"	1·040	180° to 190° F.	5d.	19·18	0·26d.

At electricity stations fitted with Diesel engines, the use of tar oil has been obtaining fairly considerable adoption. At Aylesbury there are two 100 KW. vertical three-line Diesel oil-engines, and two 200 KW. four-line horizontal suction gas-engines. With the former, the use of tar oil was started in August, 1916; and up to February this year, £996 had been saved on the fuel bill due to the use of this fuel. The present fuel costs are as follows:

	Per Unit.	Per Ton.	
Gas-engine:			
Coal	1·5 lbs.	40s.	0·32d.
Diesel engine:			
Tar oil	0·65 lb.	100s.	0·38d.
American oil	0·08 lb.	300s.	0·13d.
			0·51d.

From these figures it will be seen that, in comparison with suction gas, though tar oil is cheaper than the fuel oil previously used, the tar oil and American oil combined used in the Diesel engine is 0·2d. dearer per unit generated than the fuel for the suction-gas engine. It is said that the 0·2d. per unit at the present time represents a saving on the fuel bill of about £500 a year; and this would be beaten if so much of the output had not to be met by the use of the Diesel engines. But one would prefer the comparison carried further than the bare cost of fuel in each case. The Basingstoke Town Council are also seeking greater economy by the use of tar oil in their Diesel engines. They are fitting them with Smitar's pulverizers; and the engines are then to be started on crude oil, and, after running five minutes, are to be changed-over to tar oil. It is said that in addition to an annual saving of at least £250, it will be possible to keep the engines running for longer periods. The present ring pulverizers have to be cleaned out three times a week, whereas with the new pulverizers this operation will only be necessary after the engines have run 800 hours—a net saving of twenty-one hours per week.

Gas-Fired Boilers in Montreal.

In Montreal, there are in use to-day approximately 300 H.P. of gas steam-boilers, using about 36 million c.ft. per year, and divided among 90 customers, employing 110 boilers in units of from 1 to 16 H.P. There are also other smaller boilers not included in this list. Writing in the Chicago "Gas Record," Mr. C. D. Slimpin, Industrial Gas Engineer of the Montreal Light, Heat, and Power Company, says that Canadian gas companies have always been somewhat handicapped in securing this class of business, owing to slow delivery; but lately a local firm have been induced to take up the manufacture of gas steam-boilers of a patented design which he says is radically different from the usual type. It is built horizontally; the tubes being pieces of 1 in., or larger, pipe, capped at one end, making each independent of the other. These tubes are screwed into a cast-iron header, the inside of which is divided into several double chambers; one of each set being the inlet, and the other the outlet. The inlet chamber is in circulation with the return chamber at the lower part of the header, which is adapted to receive the return from the water-drum, and the water-feed and return. The upper part of the header is in circulation with the rear end of the drum at or near the centre. Inside this 1-in. or larger sized pipe or tube is placed a ¼-in. pipe, open at the end, through which the water passes in a thin stream, and discharges into the large tube, where the steam is generated and passes on up into the steam chamber or dome. This chamber is made of ordinary pipe—usually 4 in. or larger—capped at the ends. On it are placed safety-valves, try-cocks, water-gauge, &c. A boiler of this type requires no riveting; and it has been demonstrated that it is practically non-explosive. Should any of the tubes become choked through scale or dirt, or from any other cause, it is easy to remove them; and the opening can be plugged in a few minutes. This type of boiler is in use up to 16 H.P., and is proving satisfactory both in service and in cost of operation.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Results Compared with and without Steaming in Continuous Vertical Retorts.

SIR,—The table in Prof. Cobb's lecture is prepared from published results. The selections, however, are unfortunately all from the same system of verticals; whence a valuable opportunity has been missed to compare the effect of the different applications of the combustion chamber heats to the retorts in the several systems.

To permit of this comparison, while interest is fresh, the table has been extended, by additional published results.

GAS RESULTS.

TESTS.	MESSRS. BLUNDELL AND WEST. Averages of Columns 1, 2, 3, and 4 of previous Table, "JOURNAL" Sept. 10, p. 484. Glover-West System.		MR. DUXBURY. Averages of Eight Weekly Tests, "JOURNAL," July 9, p. 65. Dempster-Too-good System.		MR. DUXBURY. One Week's Test on Nut Coal, "JOURNAL," July 9, p. 65. Dempster-Too-good System.	
	(a)	(b)	(a)	(b)	(a)	(b)
Quality, B.Th.U. per c.ft.	514 / 476	(100) / (93)	508 / 480	(100) / (94)	508 / 460	(100) / (91)
Quantity, per ton, gas, c.ft.	14,028 / 18,100	(100) / (129)	15,804 / 20,226	(100) / (128)	15,804 / 23,521	(100) / (148)
Heat Units, B.Th.U.	7,203,442 / 8,571,300	(100) / (119)	8,028,000 / 9,708,480	(100 / (121)	8,028.000 / 10,819,000	(100) / (135)
Percentage increase in yield, per 1 p.ct. drop in quality	19/7 = 2'71		21/6 = 3'50		35/9 = 3'88	

Figures above the line = without steaming.
Figures below the line = with steaming.
Figures in brackets = percentage ratios of actual values.

H. J. TOOGOOD.

The Poplars, Elland, Sept. 12, 1918.

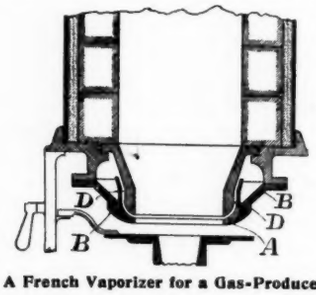
REGISTER OF PATENTS.

Vaporizing Apparatus of Gas-Producers. No. 112,282.

LE GAZ PAUVRE ECONOMIQUE, of Nantes, France.

No. 19,166; Dec. 28, 1917. Convention date, July 19, 1915.

The arrangement forming the object of this invention aims at regulating automatically (and almost instantaneously) the production of steam in such a way that its generation of steam is increased as the temperature in the fire-zone tends to rise, and is diminished as the temperature tends to fall. This object is attained by superheating the steam on its way to the incandescent fuel by a particular arrangement of the steam passage; and, incidentally, the construction of the apparatus has the further advantage of enabling it to be readily disassembled, and thus to allow easy access for cleaning.



A French Vaporizer for a Gas-Producer.

The producer comprises a metal vessel (as shown) of annular shape for the reception of the water to be evaporated. The vessel is formed by two rings of which the one constituting the outer wall of the vessel is provided in its bottom with a conical seating, into which the other or inner wall A fits. The outer wall B is rigidly secured to the base-plate, which also carries the hearth in such a way that an annular space C is left between the hearth and the inner wall of the vaporizer through which the steam is conducted to the base of the hearth and the fire. By this arrangement it is the steam and not the water which is in contact with the metal wall of the hearth. It is therefore the steam which, by being superheated, compensates for any excess of heat which may occur. The particular construction of the vaporizer also allows free play for expansion and contraction due to varying temperatures.

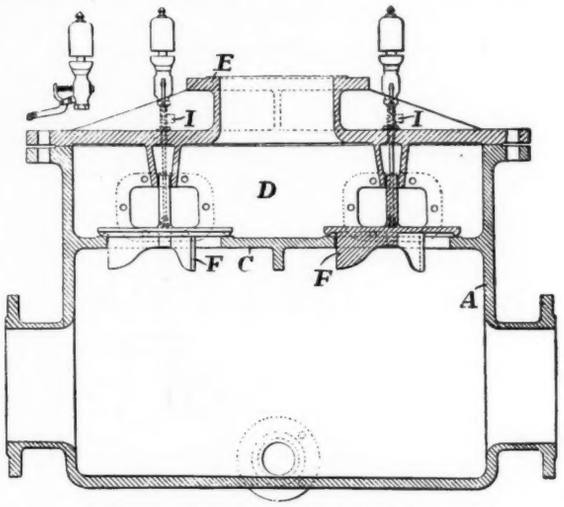
In operation, the water contained in the vaporizer is heated simultaneously by the incandescing fuel spread on the grate at the base of the apparatus and by the heat given off by the hearth. The steam thus produced spreads; and, in preventing the furnace chamber from attaining too high a temperature, it is superheated prior to its passage into the incandescent mass. As soon as the temperature in the hearth tends to rise, the production of steam is increased, the temperature of the fire is lowered, and equilibrium is established. If the temperature of the fire falls, the quantity of steam passing is decreased, and the fire resumes its normal temperature. In this manner the working of the apparatus is automatically regulated.

Destructive Distillation of Carbonaceous Substances.—No. 117,929.

WELLINGTON, S. N., of London Wall, E.C.

No. 10,974; July 30, 1917.

This invention has for its object to provide a safety device (when carbonizing operations are in progress), so that in the event of excessive pressure arising in the mains from any cause an audible signal is given, and at the same time the excess pressure is relieved. The device, which may be applied upon the foul main preceding an exhauster, consists of a casing divided by a partition serving for the support of mushroom valves directly connected with whistles operating by compressed air. The vapour and gas passes through one part of the casing, and when excessive pressure is attained from any cause the valve on the diaphragm is raised, and (being connected to the valve of the whistle directly by a rod) the compressed air is released to blow the whistle.



Wellington's Safety Device in Carbonizing Plant.

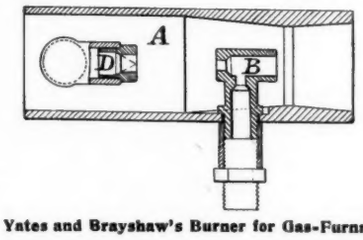
Within the casing A is a horizontal partition C, beneath which a space is formed of a cross sectional area corresponding to the vapour outlet pipe or main; and above the partition is a chamber D, to which an outlet pipe is connected at E, so that any gas released through the valves passes forward for utilization, instead of being wasted. Upon the partition one or more mushroom valves F may be mounted. Each valve is provided with a link or rod, the opposite end of which is so connected to the operating lever of a whistle cock that, on either or both the valves blowing-off (due to excessive pressure in the outlet pipe or main), the respective whistle cocks are opened, whereby air under pressure passes through the pipe I, and is released for blowing the whistles.

Gas-Fired Furnace Burner.—No. 118,239.

YATES, H. JAMES, of Aston, Birmingham, and BRAYSHAW, S. N. & E. R., of Hulme, Manchester.

No. 4812; Oct. 16, 1917.

This burner for gas-fired furnaces consists essentially in a tubular casing, a **T**-shaped gas-nozzle therein, opening towards the mouth of the casing, with an air-inlet and an independent air-nozzle in the tubular casing some distance behind, and in line with, the gas-nozzle.



Yates and Brayshaw's Burner for Gas-Furnaces.

The burner is constructed (as shown) with a tubular casing A open at the right-hand end towards the furnace; the other end being either open, or closed with a flap, as desired. Near the delivery end a gas-nozzle B, of **T**-shape, is fitted with a clear air-space surrounding it. The nozzle is formed with a wide delivery aperture facing to the right

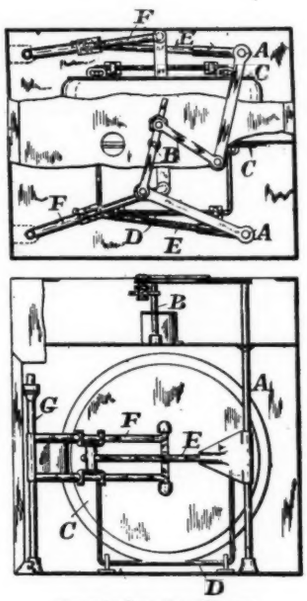
and a small inlet at the opposite end, through which a small proportion of air may enter to mix with the gas before issuing from the nozzle. Into the casing at some distance behind the gas-nozzle, an air-nozzle D is fitted, the delivery orifice of which is co-axial with the inlet and the delivery orifice of the gas-nozzle. The air issuing from the nozzle D strikes against the **T**-shaped gas-nozzle B (a portion entering the left-hand aperture) and mixes with the gas before issuing from the nozzle; the greater volume of air passing around the nozzle B and mixing with the gas within the casing A—the mixture igniting within the casing before issuing.

Gas-Meters.—No. 118,064.

MOORE, S. J. & J. S., of London, Ontario, Canada.

No. 4043; March 7, 1918.

This invention relates to dry gas-meters in which the gas chambers or bellows are formed with movable diaphragms, actuating the flag wires that move, through suitable connections, the valves and registering mechanism.



Moore's Dry Gas-Meters.

A plan (partly broken away) of parts of the meter, and a front elevation are given.

The meter is of the ordinary type save for the connections between the flag-wire and the diaphragm. To the flag wires A are connected rock arms, which, by links, are connected to the crank of the shaft B. From this crank shaft the valves and recording device are operated in the usual manner. The diaphragms C are provided with the usual guiding rock arms secured to the shaft D, journalled in bearings on the bottom of the casing of the meter. To each flag wire is connected a lever arm E, which extends well past the centre of the diaphragm, and can therefore be made considerably longer than the ordinary lever arm which extends from the flag wire to the centre of the diaphragm. A second lever arm F is fulcrummed on the casing, preferably by being secured to a rock shaft G journalled in bearings secured to the end of the casing opposite the flag wire. The arm F, in the construction shown, thus rocks on an axis substantially parallel to the axis of the flag wire lever arm, which latter has a sliding and rocking connection with the lever arm F between the ends of the latter. The lever arm thus maintains its operating connection with the flag wire lever, notwithstanding the constant changes in the relative position of the two arms as the diaphragm travels in and out.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official List" for Sept. 11.]

Nos. 14,197—14,587.

BROWN, A.—"Lighting or extinguishing gas-lamps [automatically."] No. 14,285.

COLLIE, J. H.—"Coal and gas domestic fires." No. 14,483.

GERHARDI, W. H.—"Gas cooking-apparatus for roasting, baking, boiling, or steaming." No. 14,547.

HART, W.—"Suction-gas scrubbers and coolers." No. 14,349.

M'LACHLAN, R. W.—"Incandescent gas-burners." No. 14,354.

NICOL, E. W. L.—"Fuel burners or sprayers." No. 14,436.

NITROGEN PRODUCTS AND CARBIDE COMPANY.—"Destructive distillation of carbonaceous materials." No. 14,519.

PERKIN, F. M.—See Nitrogen Products Company. No. 14,519.

SAUNDERS, T. O.—"Purification of gases." No. 14,422.

SCHOFIELD, H.—See Nicol. No. 14,436.

SLOAN, J. D.—"Process for utilization of peat, brown coal, &c." No. 14,585.

WALSH, A. C.—See Saunders. No. 14,422.

WILTON, T. O.—"Gas plant, coking-plant, boilers, and efficient utilization of heat." No. 14,408.

MISCELLANEOUS NEWS.

GAS STRIKES IN LONDON.

Comparatively small areas of London have lately experienced strikes of gas men; but there has been inconvenience for consumers in only two cases out of the three, and the duration of the trouble has been short. First there was the strike of the Hornsey Gas Company's men, which was dealt with in the speech made by the Chairman (Mr. A. M. Paddon), at the meeting of the proprietors almost immediately after the little storm had subsided. The report of Mr. Paddon's statement appeared in our issue last week—p. 491.

WANDSWORTH, WIMBLEDON, AND EPSOM COMPANY'S MEN.

An unauthorized strike of gas workers took place without warning at six o'clock on Monday morning last week in the Wandsworth and Mitcham areas, in regard to the employment of a few non-union workmen with whom the unionists refused to work unless they became members of the Union. It spread to the Epsom area the following morning. The Wandsworth Company's policy has always been that it has no objection to their workmen joining any union if they wish so to do. The Company have always allowed free access between the Union and their workmen. Moreover, the Union delegates have always interviewed the Company's officials when they wanted to. As twenty or thirty workmen, several of whom were very old servants, were not convinced by the local Union delegates that it was to their advantage to join the Union, a deadlock occurred between the unionists and the non-unionists; and it was decided late on Sunday night that the union men would strike at 6 o'clock the following morning at Wandsworth and Mitcham.

In order to effect a speedy settlement, the Labour Department of the Ministry of Munitions requested that the chief officials of the Union should meet the Company officials, and, accordingly, a meeting was arranged on Tuesday morning between Colonel Thorne, the General Secretary of the National Union of General Workers, Mr. Sidney Wright (Union Secretary of the London area), and Mr. H. E. Jones (Chairman) and Mr. H. O. Carr (Engineer) of the Company. As a result, and at the Union leaders' own suggestion, which was readily agreed to by the Company, an interview took place in the afternoon between Colonel Thorne and the non-unionists, with the result that the latter consented to join the Union; and work was resumed at 10 p.m.

As to recognizing the Union, there has always been full access given to the Union to discuss points of wages and labour, and for six months past wages have been correctly paid under the award by Sir George Gibbs for the Committee of Production. But it has been found that while the Company's action has been approved by the Committee, the effect, in practice, has put a small section of the employees at a disadvantage compared with similar employees at a neighbouring works of the Gas Light and Coke Company. On this being brought to the notice of the Directors of the Wandsworth Company, they at once went beyond the award to ensure their men being under no comparative disadvantage.

Most factories in the district were forced to stop work. Consequently several thousands of other workpeople were temporarily thrown out of employment. At one very large Military Hospital depending on gas for its cooking and hot-water supplies and the many surgical appliances and apparatus, very great discomfort was occasioned to the wounded patients.

The districts were never entirely without gas, thanks to the efforts of officers and clerks, but pressures became exceedingly low in the Wandsworth and Mitcham areas. In the Epsom area, however, a fair supply was maintained.

The officers, clerical staff, and foremen kept the furnaces well supplied throughout the strike; so that, when gas-making operations restarted, a great deal of the delay which would otherwise have been caused in restoring normal conditions were avoided.

Another report says: There has been trouble at Wandsworth—because the Union men could not tolerate in their midst the presence of a handful of non-union men; while the handful of non-union men did not see why their freedom should be taken from them, and membership of the Union be made compulsory. But the Union men apparently had other views. They, on their part, did not, or would not, appreciate why the bulk of the Company's men should contribute to the funds of the Union, and the non-contributors participate in the fruits in the way of benefits. The matter came to a head yesterday week, when the Union men left work, in order to enforce compliance with their wishes regarding the non-unionists; and at the same time the unionists decided (without reference to rules or the Executive of the General Workers' Union) to exact a fine of £1, by insisting on the non-unionists paying £1 1s., instead of 1s. to obtain admission to the Union. This is a matter to which reference will be made in mentioning the limited trouble among the Gas Light and Coke Company's men. At first the strike only applied to the Wandsworth and Mitcham men; later those at the Epsom works also became roped-in. According to the newspaper reports, there were all told something like 1300 of the Company's men "out." Voluntary workers from the clerical and official staffs fell to, and they laboured long and strenuously to relieve the situation. But by Monday night there was only a restricted supply. Some important places were in semi-darkness, people were groping their ways through the streets, work at factories was disturbed, and the residents generally in their homes learned how much they owed to the agency of gas when its supply was normal, and not interrupted by a more or less petty grievance and dispute among the Gas Company's men. The inconvenience was distributed throughout the area—rich and poor, workers and non-workers alike suffered; and the same condition of things continued on Tuesday.

Then the trouble ended, and work was resumed at night. The Company had no objection to their men being members of the Union.

So it was only a question of the few non-unionists giving way and joining the Union; and this they were able to do on the Union terms, when Col. Will Thorne, M.P., the General Secretary of the General Workers' Union, got the matter in hand, and showed that rules are made not to be broken or altered other than in a legitimate way. The newspaper reports stated that there was another matter affecting the Wandsworth men—this referring to the famous award of the Committee of Production. But in this connection, the matter had already been under the consideration of the Directors; and it was agreed that it should form no part of the strike. The question of non-union men joining the Union was the important thing, and the sole cause of the cessation of work.

It should be recorded to the credit of the strikers that they permitted men to continue to look after work essential to the preventing of accidents to the plant

GAS LIGHT AND COKE COMPANY'S MEN—A SHORT PARTIAL STRIKE.

The trouble spread to the men at the Fulham works of the Gas Light and Coke Company; and the Shoreditch station was afterwards involved. The stove shops were also affected; and some of the men of the outdoor department joined in. Work at the other stations proceeded normally; and so the number of men who went out was not great in relation to the total of the employees of the Company. This was also a short-lived strike; and in this case there was no quarrel whatever with the Company, and no wages question. It was entirely an inter-workman affair regarding the employment (as in the Wandsworth case) of a comparatively few non-union men, whom the Union men have long been trying, by the art of "peaceful persuasion," to get to join the Union. The action of the Wandsworth Company's men supplied the opportunity of bringing the matter to a head—in other words, they saw a way of getting level with those who were receiving full benefits, but were not paying subscriptions to the Union. But the Union men here again exceeded their powers and their rules, which they themselves had endorsed by their membership. In this case as in the other, they tried to enforce the condition that the non-union men should, on account of their obstinacy, be made to pay a fine of £1 in addition to the 1s. provided in the rules, for entrance fee, book of rules, membership card, and first week's subscription. To the newspapers, Mr. Will Thorne, M.P., stated that this suggested penalizing of new members could not, and would not, be enforced; it would be sufficient if the men joined the Union on the ordinary recognized terms. Mr. Thorne (who throughout the piece acted in the most energetic and straightforward manner) had, with the District Secretary, an interview with the Managing-Director of the Gas Light Company (Mr. D. Milne Watson) and the Chief Engineer (Mr. Thomas Goulden), and found that they had no objection whatever to the non-union men joining the Union. With such a large percentage of the men members of the Union, there could be no valid objection. The non-union men themselves had no great objection to becoming members; their chief trouble seems to have been the question of the illegal £1 fine, which the Union men had no power or authorization to suggest, let alone inflict. This attitude of Mr. Thorne settled the matter; and the non-union men were received into the Union on the ordinary terms, and peace was restored. Thus it will be seen that, in effect, save for the disruption of the ordinary course of work, the Company had no more interest in the matter than that of ordinary spectators. And through the loyalty at all the other stations, there was no shortage of gas in the whole of the 125 square miles of the Gas Light Company's area.

An official of the National Union of General Workers stated on Thursday morning that the unrest in the London district gas-works might be regarded as settled, though at one time on Wednesday it was feared that trouble would develop at the Beckton works. The dispute was over the question of non-union labour; and at eleven o'clock at night Mr. Thorne went down to Beckton to address a meeting of the workers. He persuaded the men of the night shift to remain at work. The report states that the names of the non-unionists would be submitted to the Chief Engineer with a view to their joining the Union. As to this, seeing that the Company have no care in the matter, the object of submitting the names to the Chief Engineer is not altogether clear.

ALLIANCE AND DUBLIN CONSUMERS' GAS COMPANY.

Directors' Half-Yearly Report.

The statement of accounts for the half year ended June 30 last shows a profit on the revenue account of £47,868; and, after providing for interest on debenture stock and temporary loans, there remains the sum of £38,485. The Directors have appropriated out of this £4060, which has been placed to the credit of the special purposes fund, being a half-year's contribution of 10s. p.ct. on the paid-up capital. This leaves a balance of £34,425, to which must be added the sum of £3079, being a credit from income-tax account, making a total of £37,504.

The Directors, in their report, say it will be remembered that at a general meeting of the Company held on Feb. 14, 1918, a resolution was passed approving of the promotion of a Bill in the last session of Parliament for the purpose of altering the statutory provisions under which the amount of the maximum dividend payable is regulated by the price of gas for the time being. The Statutory Undertakings (Temporary Increase of Charges) Bill was introduced late in the session and hurriedly passed through both Houses. By this Act the Board of Trade are empowered by Order to provide for the modification of existing statutory restrictions. In the case of this Company, the pre-war rate of dividend was less than the standard rate; and the maximum dividend which the Board of Trade can authorize will be at the rate of £3 6s. 3d. p.ct. per annum. The Bill promoted by this Company has therefore been withdrawn; and the Directors have applied to the Board of Trade for an Order enabling a dividend of £3 6s. 3d. p.ct. to be declared. If this Order is made in time, the Directors will recommend the declaration of such a dividend. Otherwise the maximum statutory dividend (owing to the increase in the price of gas which became necessary at the commencement of this year) will have to be at the rate of £2 17s. 6d. p.ct. per annum. But the Directors trust they will be empowered to adjust and pay the difference on the next occasion. In the event of the larger dividend being sanctioned, a sum of £25,702 would be absorbed; while at £2 17s. 6d. p.ct. per annum, the amount would be £22,308—leaving, in the former case, a balance of £11,801 to be carried to the next account, or a balance of £15,196 in the latter. There have been further substantial increases in the cost of coal and oil, while all other materials continue to show abnormal advances over pre-war times. But the Directors feel confident that the stockholders will be gratified at the increase in the quantity of gas sold and the results of the half-year's working.

The statement of gas made, sold, &c., is: Common gas made, 858,902,000 c.ft. (including 261,339,000 c.ft. of carburetted water gas); public lights, 15,034,000 c.ft.; private lights per meter, 729,060,000 c.ft.; total quantity of gas sold, 744,094,000 c.ft.; gas used at works, 19,458,000 c.ft.; total quantity accounted for, 763,552,000 c.ft.; gas unaccounted for, 95,350,000 c.ft.; number of public lights, 4777.

The half-yearly general meeting has been fixed for the 26th inst.

SHEFFIELD GAS COMPANY.

Report of the Nominee Directors.

In a report to the Sheffield Corporation, the Nominee Directors appointed by them on the Board of the Sheffield Gas Company, state in respect to the twelve months ended Aug. 31 last, that the year has been one of increasing difficulty to the management of the Company. The pressure and quality of gas have again been less than in previous years—a condition of affairs which appears to be the same, whether company or municipality owned, throughout the country. Shortage of men, and difficulty in obtaining the necessary plant and renewals, have been the principal causes which have conduced to this result; and though the Company have had several batches of men supplied through the Government to assist in making-up, to some extent, the gaps occasioned by men being called up for service with the forces, yet these men have been of a poor quality, and have not been able to do anything like the amount of work which gas workers generally are expected to perform. Permits, too, for plant and renewals have been difficult to obtain, and deliveries have been even worse; and there appears to have been no remedy for this state of affairs in the present war conditions, which are common to all classes of manufactures.

For the year 1917, the quantity of gas sold was 5,801,445,000 c.ft., being an increase over 1916 of 457,451,000 c.ft. The average price of gas over this period was 1s. 6·57d. per 1000 c.ft., as compared with 1s. 6·79d. in 1916. The amount of gas sold for public lamps only amounted to £415, as compared with £1988 in 1916. A large amount has been, and is now being, expended in additional plant; and the new works—for which 60 acres of ground have been obtained at Wadsley Bridge—will also involve a very large expenditure in the near future. Every effort is being made to meet the anticipated large demand for gas during the coming winter; and the Directors are hopeful—if all the necessary plant comes to hand, and sufficient labour is obtainable—that the shortage of last winter will not again occur. Probably the new Fuel and Lighting Order will be of assistance in this direction. It is expected that the present amount of women labour will be increased in the near future; and parties of women have been sent to the Vauxhall Gas-Works (London), to be trained for retort-house work.

In consequence of the large increase of wages and cost of materials, it was necessary to increase the price of gas from April 1 last by 7d. per 1000 c.ft., and again from July 1 by another 5d., which brings the highest price up to 2s. 9d. per 1000 c.ft. This has largely been caused by the Government putting an additional price on coal of 2s. 6d. per ton in the early part of the present year; and since the last increase in the charge for gas a further 1s. 6d. per ton has been fixed by the Government. Even at the present price of gas, the cost in Sheffield will compare favourably with that in force in any other town in the country. Since the war, the increases in wages to the workmen employed by the Company have amounted to a total of 20s. per week, *plus* the 12½ p.ct. granted by the Committee on Production; and further increases have now been applied for.

In March last, the then Chairman, Mr. Wilson Mappin, and the Deputy-Chairman, Mr. Hanbury Thomas, resigned their respective offices; and Alderman H. K. Stephenson, D.S.O., and Mr. B. G. Wood, J.P., have been appointed in their place. The Chief Engineer, too, resigned; and Mr. W. H. Johns, of the West Bromwich Corporation Gas-Works, has been appointed in his stead.

The Company have applied for a Provisional Order for power to construct the new gas-works at Wadsley Bridge, and for permission to use coke-oven gas for lighting purposes. This Order has gone through the House of Commons unopposed, and will be considered by the House of Lords after the recess.

Waterford Gas Company.—Mr. John Henry Sugeue (the Chairman), at the annual meeting said the continued depletion of the stocks of coal was causing the Directors the gravest anxiety. The dividends were fixed by the price of gas; the standard being 4s. 9d. per 1000 c.ft. The coal difficulty had led them to give notice of an increase in the price of gas; but fortunately, on the closing of the year's accounts, they found that their business had not diminished, and now they had been able to cancel the notice. He referred to the loyal manner in which they were supported by their employees at this time of exceptional difficulty, and said it was largely due to them that the increases made in wages had not had a worse effect on the working of the concern.

BRIGHTON AND HOVE GENERAL GAS COMPANY.

The Half-Yearly Ordinary General Meeting of the Company was held on Friday, at the Offices, No. 5, Great Winchester Street, E.C.—Mr. A. M. PADDON (the Chairman) presiding.

The SECRETARY (Mr. E. L. Burton, F.S.A.A.) read the notice convening the meeting; and the report and statement of accounts were taken as read.

AN INFLUX OF THIRTY THOUSAND PEOPLE.

The CHAIRMAN said the first matter of interest in the report was the very important increase in the business of the Company which had occurred in the period under review. This increase [7·1 p.ct. in gas sales] was connected with the extraordinary incursion from London consequent upon the air raids in the autumn of last year. It was stated locally that some 30,000 people had added themselves to the population of the district supplied with gas by the Company. This additional demand served to accentuate disabilities which had already almost reached an insupportable degree. The dividend in accordance with the sliding-scale came down to 8½ and 5½ p.ct., from the figures they were able to declare a few years ago; and it had already become necessary to make a yet further increase in the price of gas. Since June 30 there had been another addition of 4s. per ton to the price of coal; and this alone required the further increase in the price of gas. Therefore, as from Oct. 1, the charge for gas would be increased 6d. per 1000 c.ft., which would have its effect upon the dividends for the period to which it related. As to the accounts, the total capital receipts were on this occasion equivalent to only £394 per million c.ft. of gas sold; and it was to this low figure, in conjunction with the important and peculiar increase in the Company's business, that they owed whatever was favourable in the balance-sheet. In the past they had supplemented the process of reduction by the extinction of capital; but the reduction in the last twelve months had been entirely attributable to the increase in business. This low capital meant that they required for the purposes of the dividend it was proposed to distribute, and contingent charges, less than 6d. per 1000 c.ft. If the proprietors compared this with the figure required for undertakings more favourably placed and larger than theirs, it would be realized how much worse their position would have been that day if they were not able to content themselves with this very modest charge per 1000 c.ft. for dividend, interest, and other charges. In the revenue account, the sums expended for the purpose of maintaining the efficiency of the works, &c., were, in all the circumstances, creditable—amounting to over 10d. per 1000 c.ft. This, if it was not all they might wish to see, having regard to the increase in the cost of materials and wages, was nevertheless fairly satisfactory.

THE QUESTION OF WAGES.

At the bottom of the revenue account was a table showing the charges directly attributable to war conditions; and one of the items was "Allowances to employees to meet increased cost of food, &c." This description, though just in a sense, was already an anachronism, because these extra allowances, which had at different times been termed bonuses, and other forms of concession, had now practically become wages. He thought anyone who assumed that on the cessation of hostilities there would be any material reduction in wages was deceiving himself. Anyone was ill-advised who counted upon the amount paid in wages reverting to anything like its former dimensions; and he was not sure that such a reversion would be desirable. The standard of wages would be raised permanently throughout the country. It was low before the war, with its concomitant of cheap food and a vast extent of unemployment; and they would not at any rate like all these features to recur. Therefore they had better accustom themselves in prospect to wages remaining at something like the high figure at which they stood to-day. This would not be without its direct benefit to companies such as their own in regard to the business that was to be afforded by the public in the future. They had received on the revenue account £31,906 more, and the expenditure was £32,808 more; the profit being £902 less. In the profit and loss account, the profit, *plus* some small charge for interest, amounted to £18,088. They required for interest on debenture stock and temporary loans, income-tax, and dividends some £22,107, and had failed to earn this by £4019—a deficit so limited as, in the circumstances, to be entirely creditable. It did not amount to 1d. per 1000 c.ft. As to the reserves, even when the war was over there would be a sea of troubles for them to pass through; and some of these troubles might be more severe at the inception of peace than they were during the disturbed conditions with which the country was now struggling. So that, for the time being, he thought it a wise and prudent policy to preserve these funds intact, in order to ensure the credit of the Company when they would have to secure capital for reconstruction under the new condition which must necessarily obtain after the war.

THE FINANCIAL HARDSHIPS ACT.

With reference to the relief they might expect from the somewhat niggardly provision made by the Government in connection with the sliding-scale, after they had increased the price of gas to the extent he had indicated, he might tell them that all the Government had done for the gas industry was to say that they should receive not less than three-quarters of the dividend due at their standard price or of their pre-war dividend, whichever might be the less. It was an unfortunate conclusion to which they had arrived. Speaking personally, it seemed to him to have ignored the principle underlying the application for equitable consideration. It was a very simple appeal that was made to Parliament, in its essential elements. The standard price was, as it purported to be, a standard by which the relative management of companies was to be appraised. If they did well, it was to be a reward; and if they did not do so well, it was to be a deprivation. It was a measurement, and nothing but a measurement. Had they been well advised, they would have gone to Parliament and pointed out that the standard had now lost its value, and that they wished it to be replaced by something that would continue to punish them if they did ill, and reward them if they did well. Had the gas industry confined themselves simply to the matter of principle, they would have done better; but there were floods of figures, and an extent of special pleading that would have confused any tribunal, until he thought that the Committee utterly failed to understand the essential point they had to deal with.

EXTRAORDINARY DIFFICULTIES AT BRIGHTON.

As to the conditions under which the figures composing the report and accounts had been produced, he had mentioned before the extraordinary difficulty attaching to the conduct of business at Brighton during the war. All these difficulties were immensely accentuated in the period under review. In the first place, prior to the war, they were entirely dependent on coal brought by sea. The war had not proceeded long, however, before boats that could make the return trip in three days failed to do so in a fortnight; and consequently the stocks fell away. They then had to resort to coal brought by rail; but there was no railway near the works. The nearest point was some two miles away; and this station was so small that they were driven to collect their coal from four stations some five and six miles away, over very bad roads. They could not have done it, but for the sympathy and whole-hearted support of the London, Brighton, South Coast Railway Company, who helped them in every way. But for this, they must have broken down altogether with the supply of gas; and even with this help, it was only with the utmost difficulty that the supply was maintained. One boat was lost by submarine action; and even with the loyal assistance of their Contractors, Messrs. Stephenson Clarke & Co., it had been a most precarious time for them. Brighton demanded an adequate gas supply. It was filled with hospitals, convalescent homes, barracks, and camps; and all these, when started, had, as a matter of convenience, recourse to gas, and not to coal. The consequence was that the executive officers were faced with the question of what was best to be done; and they chose the only really practical course—namely, to maintain a full supply of gas all over the widely-spread district, to every consumer, and let the quality come out where it would. He could not conceive any practical man adopting the alternative.

AN INVIDIOUS PROCEDURE.

This policy proved eminently successful. Everybody had an ample supply of gas, and never failed to get out of it all that gas purported to do. At this particular juncture, one of the eight local authorities the Company supplied elected to prosecute them for failing to discharge their strict statutory duty. This was an invidious procedure. The public authority who attacked them were in acute commercial competition with the Company; and any obloquy or reproach incurred by the Company in defending themselves from the attack must redound to the authority as an important commercial asset. In exact exemplification of what he referred to, he would beg the proprietors' perusal of a letter appearing in the last issue of the "GAS JOURNAL." The Company had to appear before a local minor criminal court presided over by those who, legally speaking, did not constitute a trained tribunal; and their defence had to be heard in that general atmosphere of distrust, prejudice, and suspicion which invariably enveloped any public utility company (such as themselves) in the discharge of their duty in their own particular area. But though it was difficult for them to do so, they prepared a complete and, as it subsequently proved to be, an unanswerable defence to this attack. Yet to the amazement of their legal advisers, and of himself (after many years as practising Counsel), the decision was against the Company. Neither on domestic grounds nor on those of public policy could the Directors leave the matter there. They appealed; and before a highly-trained legal tribunal the decision was reversed, with costs.

OTHER MATTERS.

Reference was then made by the Chairman to the wages paid by the Company. He said many of the advances made by them had been given freely and voluntarily in the early stages of the war, in anticipation of the actual needs of the employees. As to control, gas undertakings were not now free agents in any important regard; and he could not help thinking it was a thousand pities that the Government did not come to an end of the matter even now, and take over the gas industry entirely, as they did the railway system, giving them a fair rate of dividend. At present, it was a maimed industry. There was hardly a hindrance or a disability that the Government had not imposed upon it. He concluded by moving the adoption of the report and accounts.

The DEPUTY-CHAIRMAN (Mr. G. W. Carey) seconded the resolution; and it was carried unanimously, without discussion.

THE DIVIDENDS.

On the proposition of the CHAIRMAN, seconded by Mr. A. F. PHILLIPS, dividends were then declared at the statutory rates per annum of 6 p.ct. on the "B" preference stock, 4 p.ct. on the "C" preference stock, 8½ p.ct. on the original ordinary stock, and 5½ p.ct. on the "A" ordinary stock.

VOTES OF THANKS.

The CHAIRMAN proposed, Mr. H. E. JONES seconded, and the proprietors accorded, a vote of thanks to the executive officers, for the signal services rendered by them during this particular period.

Mr. BURTON and Mr. C. H. RUTTER (the Engineer and General Manager) briefly returned thanks.

Mr. H. E. JONES next proposed a similar vote to the Board, who, he said, had not only had all sorts of other difficulties, but had been prosecuted for not accomplishing the impossible. He urged them all to keep a stout heart, as the war could not go on for ever; and when it was over, they would come into their own. He had never handled a set of accounts that showed more far-seeing prudence and economy in the matter of capital.

The vote was seconded by Mr. W. A. HOUNSOM, and supported by Mr. A. W. OKE.

In acknowledgment, the CHAIRMAN remarked that the vote derived added importance from the fact that it was proposed by the President of the Institution of Civil Engineers, and the doyen of the gas industry.

NORTH MIDDLESEX GAS COMPANY.

Reduced Business—Increased Price.

The Half-Yearly Meeting of the Company was held on Monday of last week, at the Offices, No. 5, Great Winchester Street, E.C.—Mr. A. M. PADDON (the Chairman) presiding.

The SECRETARY (Mr. E. L. Burton, F.S.A.A.) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

The CHAIRMAN, in moving the adoption of the report and accounts, said there were in the former two particulars not satisfactory in their nature. One was the reduction sustained in the business during the period under review; and the other was the increase in the price of gas of 5d. per 1000 c.ft. They did not want to commence this half year with a recorded decrease in the output of gas, because they would shortly have to face the restrictions imposed by the Government, which were bound to be reflected in the accounts to an extent which at the present time could not be estimated. As to the increase in the price of gas, this was to a certain degree deprived of any malign significance to the proprietors, because it would not necessarily affect the dividend. They could increase the price of gas to this extent without reducing the rate of dividend they were now paying, provided that they were able to earn it during the next six months; and there were certain safeguards and securities in support of their endeavours in this direction. The accounts would pay for a little examination, because they were really a good deal better than they appeared to be in their *primâ facie* aspect. The capital was equivalent to £612 per million c.ft. of gas—a low figure for a Company of this size. In spite of the scale of their operations, the corresponding statistics connected with the great Metropolitan Companies would show that the North Middlesex Company was far below what most of them were. Again, the price of gas on which the present accounts were based was only 3s. 6d. per 1000 c.ft.; whereas in the centre of London 4s. 4d. was being charged by the largest undertaking. In the revenue account, the important point was that the Board had made adequate, and even ample, appropriations on the debit side, before the results now presented had been arrived at. They had spent on repair, maintenance, and renewal of works and plant nearly 7½d. per 1000 c.ft. of gas, which was easily justifiable having regard to the cost of materials and labour at the present time; but it was a full figure compared with what other undertakings were charging in these days. Their total charges for maintenance and renewal were, as a matter of fact, 14d. per 1000 c.ft. The profit was £1602 less. They had spent £587 more, and received £1014 less. Coming to the profit and loss account, there was by way of profit and interest £6644; and they required for dividend, and those charges (income-tax, interest, &c.) which were now always growing out of proportion to what they were in pre-war times, £7995, which left them with a deficit of £1351. Of course, this would be unsatisfactory, except for the low price at which they had carried on their business, and the policy of not making any attempt to present a more favourable statement than was warranted, and more than warranted, by the figures. The reserve fund amounted to nearly £20,000, and had been written-down until the actual investments fully represented this sum as the available amount. The insurance and renewal funds were both small, but similarly available. An even more satisfactory item in the difficult days in which they lived, was the statement on the credit side of the balance-sheet, that in cash and in temporary investments they had upwards of £20,000 immediately available. This comfortable cash position was really a matter for mutual congratulation between the proprietors and the Board. The proprietors would be anxious as to the future; but the Directors knew very little more about it than the shareholders did, except that in almost every particular fresh difficulties threatened. They were all aware that labour was troublesome; and the genesis of this difficulty undoubtedly existed in the indiscriminate and abnormal rates of pay granted to certain forms of special employment in the early stages of the war, which upset men in regular work. Then, of course, there was the trouble of the very necessary restriction of fuel consumption. The precise share in the reduction of business that would fall upon gas companies was hard to determine; but it would not advance the national interests to restrict the operations of the gas industry in any degree at all. They knew there was a shortage of coal; but the Government should see that it was used to the best advantage. If a ton of coal went into a private house, the consumer did very well if he got about 2 cwt. out of it in useful calorific energy; but when the same ton went into the gas-works, instead of 18 cwt. being wasted, he doubted very much whether more than ½ cwt. was wasted. Any curtailment of the gas industry's activities during this time would re-act on the immediate necessities of the Government for carrying on the war. The Company were not concerned with the sliding-scale relief measure, because their arrangements did not render it necessary to apply for such relief.

Mr. H. A. LERMITTE seconded the motion, which was carried unanimously.

On the proposition of the CHAIRMAN, seconded by Mr. S. A. SAMPSON, dividends were declared for the half year (less income-tax) at the rates of 5 p.ct. per annum on the preference capital, 11 p.ct. per annum on the original ordinary capital, and £7 14s. p.ct. per annum on the additional ordinary capital.

The CHAIRMAN proposed a vote of thanks to the executive officers for their all-important contribution to the accounts submitted that day. The results of the Engineer and Manager (Mr. Lawrie Trewby) spoke for themselves. There was very little fault indeed to be found with his work. As to Mr. Burton, he discharged more than the ordinary duties of a Secretary.

Mr. A. F. PHILLIPS, in seconding, agreed that Mr. Trewby's results were excellent, while his gas was maintained at a quality sufficient to satisfy the most scrupulous of persons.

Mr. BURTON and Mr. TREWBY having briefly responded, the Chairman and Directors were accorded a similar vote, on the proposition of Mr. A. W. OKE, seconded by Mr. F. R. SMITH.

LEA BRIDGE DISTRICT GAS COMPANY.

An Eminently Satisfactory Statement.

The Half-Yearly Meeting of the Company was held on Tuesday last, at the Offices, Nos. 63 and 64, Chancery Lane, W.C.—Mr. A. M. PADDON (the Chairman) presiding.

The SECRETARY (Mr. Richard Sandell) read the notice convening the meeting; and the report and accounts were taken as read.

The CHAIRMAN remarked that the accounts, even if they stood quite by themselves, without any reference to the prevailing circumstances, would be found to be very good in their character; but when qualified by all the difficulties as to which the proprietors were cognizant, he was sure they would agree that it was an eminently satisfactory statement the Board were able to submit. During the six months ended June 30, they had had an increase in business of 3·3 p.ct., and an increase was never more welcome or more fortunate in its incidence. Increases were now governed by the national position with regard to fuel; and they could not be hoped for in face of the limitations which the Government had quite properly imposed. But up to the present this half year the Company had not lost ground; and the Directors trusted, by reason of the nature of their business, that they would not suffer to the extent that undertakings less fortunately situated than themselves would do during the balance of the current period of account. They had an industrial area over which they distributed gas; and in these special circumstances a very satisfactory proportion of the gas was supplied upon the prepayment system, which might be counted upon to be less affected by the restrictions than the ordinary consumers. On July 1, the price of gas was increased 3d. per 1000 c.ft.; but this increase would not affect the dividends they would be empowered to distribute at the end of the year, if they succeeded in earning them. In the revenue account for the past half year, it would be seen that the results all through had been based upon a selling price of 3s. 3d. per 1000 c.ft.; and this in itself was sufficient to give them a very favourable complexion. At the present moment, the largest of the Metropolitan Companies was charging 4s. 4d.; and this price would become more general. Taking into account the increase he had already referred to, their own Company were to-day selling at 3s. 6d., which was very encouraging, in view of the margin it allowed for dealing with future difficulties. The apportionments that had been arrived at on the debit side of the accounts were ample to secure the maintenance of the works, &c., notwithstanding the fact that much more had to be spent in these days. The total expenditure was £1561 more, which was qualified by additional receipts to the extent of £134; the profit being £1426 less. The profits and minor receipts amounted to £9055; and there was needed for interest, income-tax, and dividend £8999. Thus they had the rather exceptional result of a surplus of £56 beyond their requirements on the half-year's working, after paying a pre-war rate of dividend. The reserve and general purposes funds were fully invested, and had been written-down to approximate values at the present time; and they had, in addition to some £22,000 thus invested, cash to the extent of nearly £10,000. This in itself was a security of incalculable value in times like these. As to the future, they were all anxious; but there were some comparative points of advantage in this particular undertaking. The character of their business was in their favour; and very important national enterprises and industries were in their area. They had, of course, difficulties in common with all other industrial undertakings. The labour trouble was always with them; but in so far as it had been possible to establish a good understanding with one's workpeople, it had been done in this case. Their relations were amicable. Another menace was the question of obtaining material; but they had at the moment a reasonable stock, and a tolerably promising assurance that they would be supported in an adequate way by the Coal Controller through the winter. Fortunately, they were not concerned with the question of standard price and dividend. Therefore they were entitled to look forward with rather more than the usual degree of hopefulness now attaching to the administration of a gas undertaking. He concluded by moving the adoption of the report and accounts.

The DEPUTY-CHAIRMAN (Mr. G. W. Carey) seconded the motion, which was carried unanimously.

Proposed by the CHAIRMAN, and seconded by Mr. A. F. PHILLIPS, dividends were declared, less income-tax, at the rates per annum of 5 p.ct. on the preference stock and 6½ p.ct. on the ordinary stock.

The CHAIRMAN then proposed a vote of thanks to the executive officers whose labours had produced the results to which he had referred. One thing, he said, which went to mitigate the anxiety and apprehensiveness of the Directors was the complete confidence they had in their Engineer and General Manager, Mr. F. W. Cross. There was hardly a difficulty or a contingency which his experience and skill would not qualify him to deal with on his own account, even if he had not a Board behind him.

Mr. E. L. BURTON seconded the vote, which was heartily accorded.

Mr. SANDELL and Mr. CROSS both briefly replied; Mr. Sandell mentioning that he had been with the Company fifty years, and could remember it when the capital was not so much as the annual profits now were.

A vote of thanks to the Chairman and Directors concluded the proceedings.

Gas Prices in Australia.—The report of Judge Ferguson upon the New South Wales Gas Companies' application for an increase in the price of gas, raised the standard price from 3s. 6d. to 4s. 8d. per 1000 c.ft. The Government, however, are of opinion that in war time any increase in the price of a commodity of this kind should be kept as low as possible, and have, after consultation with the companies concerned, decided to gazette the new standard price on receiving undertakings from the companies that the selling price shall not be increased above 4s. 5d. per 1000 c.ft., without further consideration of the matter by the Government. The price in Melbourne is 4s. 7d. per 1000 c.ft., in Adelaide 6s., in Brisbane North 6s., and Brisbane South 6s. 8d.

GLASGOW GAS LIGHTING CENTENARY.

The centenary of gas lighting in Glasgow has, remarks the "Glasgow Herald," been reached at a time when the night aspect of the streets suggests the illumination of the oil-lamp; but though the event cannot be honoured by appropriate celebration, our contemporary has done something to mark it by quoting a number of facts, principally extracted from official documents in possession of the Corporation Gas Department.

It was not until Sept. 5, 1818, that gas shed light on Glasgow streets. But while this was the first official recognition of Murdoch's invention, an ingenious pioneer, Mr. Lumsden, a bookseller in the Trongate, made a retort in his shop, and provided it with gas, in 1805. Publicly the introduction dates from the Act of 1817, obtained by the Glasgow Gas Company; and the first gas-works were erected in Kirk Street, near the High Kirk. Glasgow was among the first cities to municipalize the gas supply. The Corporation in 1869 took over the undertakings of the two rival Companies; and the municipalization marked the real beginning of the gas enterprise in Glasgow. In 1818, there were 1472 lamps on the streets; and in 1869, 10,657 public and private lamps—requiring a supply of 42,170,100 c.ft. of gas. The antiquarian may find rich fodder in the burgh records bearing on the development of the gas enterprise; and the numerous and devious litigations involved make an interesting chapter, and indicate how hard is the way of the municipal reformer. At a time when consumers are paying 3s. 9d. per 1000 c.ft., it may, the writer says, be some consolation to know that in early years the price was 10s., and that for long it stood at 5s. It has been as low as 1s. 11d. The price of 10s. was for the meagre light of the cockspur, and 5s. when the slender flame of the rat-tail burner shed dim rays on the street and entry. This is the incandescent age; and incandescent gas lighting has a big future, notwithstanding the advance in electricity. The quantity of gas delivered last year was 8,189,904,386 c.ft.; 892,026 tons of coal were carbonized; the net sum realized from the sale of coke was £242,441; and the gross revenue of the department amounted to £1,621,779.

KENDAL GAS-WORKS ACCOUNTS.

Reporting to the Kendal Corporation Gas Committee on the results for the year ended March 31, Mr. W. R. Wilson (the Engineer and Manager) states that the gross profit amounts to £4733; and after setting aside £4100 for interest and sinking fund charges, and £62 for war allowances, there is a surplus of £837. Out of this surplus and the balance brought down there has been voted £1308 to wipe out the cooker stock account, and £186 to renewals account. The reserve fund remains at £5000; and the sinking fund (including debt repaid) stands at £22,925.

During the year, the quantity of coal carbonized was 6803 tons, being a decrease of 495 tons, or 6·87 p.ct. on last year. The total cost of the coal delivered upon the works was £8977, or 26s. 4·7d. per ton. The total gas made was 97,927,600 c.ft.—an increase of 4,901,100 c.ft., or 5 p.ct. The gas sent out from the works, including the public lighting, was 87,609,500 c.ft., an increase of 4,074,200 c.ft., or 4·88 p.ct. The receipts for coke show a decrease of £179, due to less coal being carbonized, and the use of steam for gas making.

Excellent results have been obtained from the Woodall-Duckham vertical retort plant. In order to conserve the consumption of coal, a system of steaming charges was adopted last year, with the result that, though the quantity of gas made was greater by 4,901,100 c.ft., the decrease in coal carbonized was 495 tons. The price of gas has been maintained at 2s. 11d. per 1000 c.ft., or 16·67 p.ct. above the pre-war rate.

The amount of gas made per ton of coal carbonized was 14,393 c.ft., as compared with 12,745 c.ft. in the previous year. The percentage of unaccounted-for gas was 9·2, as against 8·79. The net proceeds of coke and other residuals on cost of coal was 53·66 p.ct., and the average price realized for gas 3s. 1·62d. per 1000 c.ft.

LOCAL ORGANIZATIONS OF MANUFACTURERS.

A Tottenham and District Example.

The advantage of organization among manufacturers representing a particular industry is well typified by the Society of British Gas Industries; but it is obvious that there is also excellent scope for organization among manufacturers of all kinds identified with a particular locality. Apart from their own business interests, they have much in common in connection with such matters as transport, rating, and the general developments in the surrounding districts which contribute, not only to their own well-being or otherwise, but to the well-being or otherwise of their employees. An example of what can be done in this direction is found in the North London Manufacturers' Association. While there is currently much talk going on as to what should be done after the war in connection with co-operation for various purposes, and the improvement of the relations between employers and employed, this Association is already at work; and so a little information as to its objects may be useful to manufacturers in other districts.

The organization is entirely a voluntary, non-political and unofficial, strictly local, Association. It originally consisted of manufacturers in Tottenham and Edmonton, but now includes members with works situated as far apart as Wealdstone, Ponder's End, and Leyton. The primary aim of the Association can be put into four words, "Co-operation for mutual benefit." In the first place, and before all, is sympathetic co-operation between individual employers and their respective employees, with a view to breaking down the barrier of distrust and suspicion which is more than anything else responsible for the seemingly intransigent attitude adopted by Labour towards what is

MAIN D. S. O. FIRES

FOR FUEL ECONOMY.

HYGIENIC AND EFFICIENT.

Made in 55 sizes with a pleasing variety of designs.

Component parts are interchangeable, with Burners reversible, throughout each series.

Special Prices. . . . . Write for latest List.

ORDER NOW WHILE MATERIAL IS AVAILABLE.

R. & A. MAIN, LTD.

WORKS: Gothic Works, EDMONTON, N. 18; Gothic Ironworks, FALKIRK; and Gothic Works, BIRMINGHAM.

SHOWROOMS and BRANCHES: 25, PRINCES STREET, OXFORD CIRCUS, W. 1; 82, Gordon Street, GLASGOW; 18, Severn Street, Deansgate, MANCHESTER; 97, Millfield, BELFAST; 333, Queen Street, MELBOURNE; and 12, Cunningham Lane, Pitt Street, SYDNEY, N.S.W.

loosely called "Capital." In connection with this is the gradual introduction and permanent establishment of better and more human relations between wage-payers and wage-earners in North London and elsewhere. In the second place, there is co-operation between individual firms for the achievement, both in principle and detail, of the above-mentioned cardinal aim of the Association. Also for the cultivation of personal acquaintance and the encouragement of the "get-together spirit" between the members. There is also the interchange and circulation of useful and interesting information and ideas on business matters generally, with a view to the co-operation of individual members in the work of the Association, instead of leaving it to a few energetic members of the Council. Furthermore, there has to be undertaken the joint solution of local and general industrial problems, especially during the "reconstruction" period, as well as the combined action by all members for: (1) The protection of their interests for securing justice, but not privileges, in such matters as local rating, especially of machinery. (2) The improvement and standardization of public and semi-public services in the different districts in North London—*e.g.*, traffic, return of empties, adequate representation of all interests in municipal government, and so on. (3) The furtherance of, or opposition to, specific schemes affecting local or even, on occasions, national industrial interests—*e.g.*, housing, tariffs, (whether general or particular), education, &c. (4) The attraction of desirable, and the prevention of undesirable, new industries to and in particular districts, and the fostering and extension of existing industries. (5) The extension and development of trade and manufactures in North London in particular and the British Empire in general. (6) Concerted action, without "overlapping" with other local or national bodies formed for similar or approved objects. The Association also aim at furthering the interests of individual member-firms who choose to submit particular problems for general consideration and suggestion. Finally, there is the general elevation, morally and materially, of commerce and industry in the district served by the Association and the country generally. We hope this information will be useful to manufacturers in other localities—more especially in those that do not boast a Chamber of Commerce.

Just recently a paper was read before the Association by Mr. Hubert B. Graham on "The Relations between Employers and Employed after the War." Among the speakers on that occasion was Mr. Archibald P. Main, Chairman of the Council of the Society of British Gas Industries, who is identified with a firm well known to the gas industry who have extensive works at Edmonton within the area of the operations of the Association.

Lighting Economy and Shop Closing.—The Secretary of the Early Closing Association has been in correspondence with the Coal Controller on the subject of economizing shop lighting during the winter; and it is announced that, without waiting for a compulsory Order, employers in all trades have voluntarily agreed with the Association to close at 6 or 6.30 on and after Oct. 1.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Sept.* 16.

Pitch still maintains great activity in the London tar products market; the price of not below 65s. net per ton *ex* producers' works being very firm. Numerous inquiries are being received from Home and export trade, and shipments are being steadily effected. There are some inquiries for solvent naphtha; and the price is somewhat easier. Anthracene remains at 6d. net per unit per cwt. All other products under official control remain unchanged.

Deliveries of sulphate of ammonia are now being made for September to November period at the official price of £15 15s. per ton on the 24½ p.ct. basis, with a reduction of 10s. per ton to approved agents.

Tar Products in the Provinces.

Sept. 16.

The average values for gas-works products during the week were: Gas-works coal tar, 31s. to 35s. Pitch, East Coast, 37s. 6d. to 40s. per ton; West Coast—Manchester 25s. to 30s., Liverpool 25s. to 30s., Clyde 25s. to 30s. nominal. Benzol 90 p.ct., North, 10d. to 11¼d.; 50-90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 3d. Coal tar crude naphtha in bulk, North, 7¾d. to 8¼d. Solvent naphtha, naked, North, 2s. 7d. to 2s. 8d. Heavy naphtha, North, 2s. 11d. to 3s. Creosote, in bulk, North, 4d. to 4¼d. Heavy oils, in bulk, North, 4¼d. to 5d. Carbolic acid, 60 p.ct. East and West Coasts, 2s. 6d. naked, nominal. Naphthalene salts, £6 to £7, bags included. Anthracene, "A" quality, 4d. to 6d. per unit; "B" quality, 1½d. to 2d.

Manchester District Tar Prices.

The average price for tar in the Manchester district, based on the value of the products for the month of July, was 37s. 7d. per ton.

FROM A MARKET CORRESPONDENT.

Tar Products.

Business shows a tendency to increase, although in most quarters considerable anxiety is being shown as to the ability of works to maintain production during the coming winter at anything like current level. Everything depends on the supply of coal; and there are serious misgivings on this point. Already there is a falling-off in supplies; and it is quite impossible to accumulate any stocks. Another point which is troubling producers is the difference in costs of production and sale prices for a good many commodities; for even where a profit is shown, the profit is rapidly moving towards vanishing point by reason of increased costs of output, such as higher wages and heavier

250—ONE SINGLE ORDER ALONE—250
WRIGHTS
"B.T.U"
(GAS HEATED)
WRIGHTS
"B.T.U"
(GAS HEATED)
For Hard-Water Districts our special "ANTISCALE" Treatment enables lime deposits on internal metal parts to be removed without detriment to the boiler.
HOT WATER ALWAYS AVAILABLE
For Soft-Water Districts our BOWER-BARFFING Treatment prevents the corrosion of internal metal parts.

From many orders received for our "B.T.U." Combined Circulating Boilers and Storage-Tanks, special mention may be made of one for 250 for the Equipment of a large scheme of Workmen's Dwellings now under construction.

JOHN WRIGHT & CO., ESSEX WORKS, ASTON, BIRMINGHAM.

charge for coals. The wonder is, considering all the circumstances, that market conditions remain so good. Pitch is in much request from the Continent, and one or two London people have made 60s. per ton f.o.b. recently, although 57s. 6d. per ton is the more usual price. Provincial markets still find trouble in getting into the export trade, either direct or through London. There are several difficulties to be overcome either way; and so far the railway companies appear unwilling to extend facilities—only very small shipments having been made from East Coast ports. Solvent naphtha is rather better inclined after its weakness, and here and there one finds talk of a possible shortage later on. From 3s. to 3s. 6d. per ton are fair quotations. Heavy naphtha remains good at 3s. 3d. Refined naphthalene makes £28. Crudes are tending to better prices, and are making from £6 to £14 10s. per ton, according to quality. Benzol and toluol remain unchanged. Tar is still about 4d. per gallon in bulk. Creosote is in good demand on official account. Carbolic acid, crude 60s, still make 2s. 6d. per gallon, and crystals 40 p.ct. are selling at 1s. 2d. per lb., much to the disgust of sellers of crude, who are credited with the intention of raising prices—there being, in their opinion, too great a profit from crystals at 1s. 2d. Cresylic acid at 3s. 6d. per gallon is much required for the manufacture of disinfectants. Aniline oil is unchanged at 1s. 2d. per gallon, and anthracene can still be had at 6d. per unit per cwt.

The range of quotations is as follows:

Benzol: 90% London, 1s. 0½d., North 10½d. to 11½d.; 50% North 1s. 4d. to 1s. 5d. naked per gallon.

Carbolic Acid: 60% East and West Coast 2s. 6d. per gallon; crystals 40% 1s. 2d. per lb.

Crude Tar: London 32s. 6d. to 35s.; Midlands 27s. to 29s.; North 28s. to 30s. per ton *ex* works.

Pitch: London 57s. 6d. f.o.b. works; East Coast, 33s. f.o.b.; West Coast, 32s. to 33s. f.a.s.; Manchester, 32s. 6d. upwards; Clyde 32s. to 33s.; South Wales 42s.

Solvent Naphtha: London 3s. 3d. to 4s.; North and Midlands 3s. to 3s. 6d. per gallon.

Crude Naphtha: Naked 30% 8¼d. to 8½d.; North 6¼d. to 6½d.

Naphthalene: Refined £28 per ton nominal; salts 80s., bags included.

Toluol: Naked, London 2s. 4d.; North 2s. 3d.

Creosote: Nominal, London 4¼d.; North 4d. to 4¼d. (Government price, 75s. per ton f.o.b.—equal to 4⅝d. per gallon); heavy oil, 4¼d. per gallon in bulk.

Anthracene: "A" quality, 40-45%, 4½d. per unit; "B" quality, 1¾d. to 2¼d.

Cresylic Acid: 95%, 3s. per gallon; 97-99%, 3s. 3d. to 3s. 6d. per gallon, casks included *ex* works London and f.o.b. other ports.

Grease Oils 18° Tw. (naked) £6 per ton f.o.r. makers' works.

Sulphate of Ammonia.

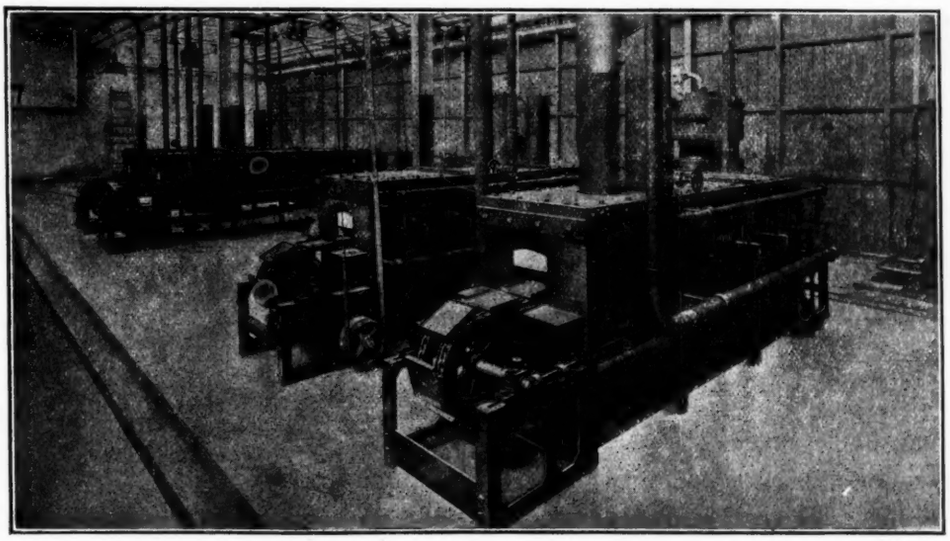
There is nothing fresh to report in this product. Conditions regarding the home supply have not altered, and are unlikely to do so for some time to come. The demand increases on every hand, and supplies if anything appear to get shorter. It would seem that if the Government wish to get producers and others interested in synthetic ammonia now is the time to do it, by publishing some official data as to cost of production, output, &c.

Price of Gas at Newcastle-upon-Tyne.—The addition of 4s. per ton to the cost of coal represents nearly £80,000 per annum to the Newcastle and Gateshead Gas Company; and as from the meter-readings this month, the price per 1000 c.ft. of gas to ordinary consumers will be increased 3d., making a total increase of 1s. 3d., or 60 p.ct., since the commencement of the war. The quantity of gas supplied to prepayment consumers will be reduced by 3 c.ft. per penny. It is also necessary to lower the rates of discount to large consumers which for some time have been allowed in excess of the minimum prescribed by the Company's Acts.

Irish Gas Prices.—The Belfast Corporation adopted the Gas Committee's recommendations for increases, from the beginning of next quarter, in the prices of gas for private lighting, cooking, and heating to 3s. 9d. per 1000 c.ft.; and for high-pressure purposes to 3s. 11d., subject to 20 p.ct. discount on quarterly accounts. To residents in the Cregagh district outside the city boundary, the price is increased to 4s. 7d. per 1000 c.ft. The Enniskillen Gas Company have increased the price for lighting to 8s. per 1000 c.ft., and for cookers and power to 7s. 6d. At the Omagh Urban Council meeting, a recommendation was made that advantage should be taken of the recent Act to extend the powers so as to increase the price of gas from 4s. 6d. to 5s. 10d. per 1000 c.ft. On a motion that no increase be made at present the voting was equal; and the Chairman said the recommendation still stood. The Coleraine Urban Council have decided to suspend public lighting for the winter, and to increase the price of gas from 5s. 10d. to 6s. 8d. per 1000 c.ft.

How to Use Gas for Water Boiling.—On the subject of advice as to the economical use of gas, the Hastings and St. Leonards Gas Company point out that most people, when making a couple of cups of tea, put a quart of water in the kettle, whereas a pint is all that is needed. Result—twice as much gas used as is required. Again, there is great waste in the cooking of joints. Many cooks keep the gas turned-up because they think they burn less gas by getting the joint done quickly. As a matter of fact, nothing is gained, but a good deal of gas is wasted, by this practice. Much more gas is consumed in a short period with the gas turned high than in the long period required to obtain the same result with the gas turned low. Put a quart of water in a kettle, and bring it to the boil with the gas full on; then put the same quantity, and bring it to boil with the gas turned as low as possible. One will find that the latter process takes more time; but the quantity of gas consumed is much less than in the quick and short boiling. In a recent test, the difference was as much as 40 p.ct.

Gas in War Time Industries



No. 10—Shell Parts. Battery of four "Richmond" Belt Driven Conveyor Furnaces for providing a continuous supply of Brass Billets heated to the requisite temperature for drawing or pressing.

THE RICHMOND GAS STOVE & METER CO., Ltd.,
WARRINGTON and LONDON.

Unprofitable Prepayment Consumers.

The Hastings and St. Leonards Gas Company having sent out notices of alterations in the prepayment meter arrangements, in accordance with which consumers not burning a minimum quantity of 4s. worth of gas per month for penny-in-the-slot meters and 8s. for shilling-in-the-slot meters would have the charges for their meters raised, a local paper remarked that the consumers were puzzled, because they were told, on the one hand, to be economical in the use of gas, and, on the other, that unless they consumed a certain quantity they would have to pay more for their meters. On the face of it this seemed a contradiction in terms. A sound explanation was, however, promptly forthcoming from Mr. C. F. Botley, the Company's Engineer. Briefly it is that, having regard to the capital expenditure on the appliances and departmental charges, there is an actual loss to the Company on every meter fixed unless the minimum quantity of gas stated is used. It was open to the Company to increase the minimum quantity; and if this had been done in the same ratio as the increase in the cost, the charge would have been 6s. and 10s. instead of 4s. and 8s. But, in order to make it as easy as possible for the consumers, it was decided not to take this course. In normal times, the agreement with the consumer is that he may be charged rent at the rate of 10d. per month, should the average amount collected per month be less than 4s. Now this charge is raised to 1s. 10d. It is held that if the consumer does not use 4s. worth of gas a month, he cannot want it much; and as there are many people waiting for meters, who would consume more than the minimum quantity, it would obviously be to the Company's advantage if the very small consumers gave up their meters. The charge that the Company are forcing small consumers to use more gas than they need, is not well founded. There are many small consumers who keep their slot meters merely as a stand-by, and, in some cases, use less than 6d. worth of gas a month.

Walsall Gas-Works Accounts.—The accounts of the Walsall Corporation gas undertaking for the year ended March 31 show a net profit of £1310, as compared with £2476 for the previous year. The Committee recommend that this sum be carried forward. The Gas Committee report that the recent increases in the price of coal represent an additional cost of £9000 per annum; and they are therefore compelled to take into consideration the question of a further increase in the price of gas. Mr. Venables, in presenting the Gas Committee's report to the Town Council, said the gross profits amounted to £15,765, against £16,816 in 1917, and £19,694 in 1916. The increase in the cost of coal was 46½ p.ct., and of wages 57½ p.ct. The Committee's chief source of anxiety now was with regard to the coal for the ensuing winter; and they had very grave doubts as to whether the supply of gas would be maintained over a most important period of the year, if existing conditions did not improve. Whereas twelve months ago they had 9000 tons of coal in stock at the gas-works, to-day they had only 300 tons.

Heavy Fine for Illegal Gas-Connections.

Last Tuesday, at the Newcastle-upon-Tyne Police Court, George Robertson, a pattern maker, was charged with having, between May and August, stolen a quantity of gas belonging to the Newcastle and Gateshead Gas Company. There were two further charges of having unlawfully laid, or caused to be laid, pipes which connected the main with a gas-engine and with the lighting appliances. Two inspectors and a police officer visited the premises; and, on the removal of cloths from the top of the gas-engine meter and the lighting meter, it was found that rubber-pipe connections had in each case been made with the main, so that the gas was not registered in the meter. Complaints had been made by defendant on three occasions about the gas pressure. The defect was found to have been caused by naphthalene getting into the engine; and the matter was immediately put right by the Company. It was admitted that the gas had been used on 35 days, which was half the time named in the charge; and Mr. Forster (for the Company) pointed out that the penalty for illegal user was £5 and 40s. for each day. It was a serious offence; and he pressed for a severe penalty. He agreed to the withdrawal of the summons in respect of the theft. Mr. Franklin (for the defence) said defendant was engaged on very confidential Admiralty work. There had been complaints made to the Company about the two meters. Defendant could not get sufficient pressure of gas to drive his machinery; and as he had been threatened with the withdrawal of the contract, he made use of the connections. The gas had not been used continuously, but only for an hour or two each day on the Admiralty work. It was a foolish thing for defendant to have done, as he knew he must be found out when the periodical inspection of the meters was made. On each of the two charges of having made illegal connections, defendant was fined £5, and a penalty of £1 per day for 35 days in respect of each of the two meters—£80 in all.

Lighting Difficulties at Nottingham.—Shortage of coal supplies threatens to entail serious difficulties at Nottingham; the available stocks never having been of such a depleted character. Supplementing the appeal which has already been made to ordinary consumers, shopkeepers are now being asked to curtail materially their consumption of gas and electricity, by closing their establishments at 6 o'clock on Monday, Tuesday, and Wednesday evenings during the winter months, and at 7 on Fridays and Saturdays, in addition to the usual weekly half-holiday on Thursdays. Alderman A. Ball (the Chairman of the Gas Committee) has commended it as being incumbent upon all, in the public interest, to fall in with this arrangement. He points out that, under present circumstances, the lighting services cannot be properly maintained unless shopkeepers loyally co-operate with the authorities. None of them would be any the worse off. On the contrary, they will be the gainers, because they will do as much business, and save on their lighting bills, which, at the increased prices recently decided upon, is an important consideration.

USE Simmance's

DEAD BEAT INDICATORS

instead of WATER-TUBE GAUGES and

"READ THE PRESSURE BY THE POINTER."

No liquid to evaporate and no levels to adjust.

No glasses to break and nothing to clean.

Direct reading, Open scale, Any range (Pressure, Vacuum, or Combination).

Incorrodible, Accurate, for foul or purified gas.

MADE IN MANY RANGES WITH TABLETS LETTERED AS DESIRED.

ALEXANDER WRIGHT & CO., LTD., WESTMINSTER.

Agents: Australia—FYVIE & STEWART, 360, Collins St., Melbourne; Canada—W. P. ROPER, 502, Merchants' Bank Building, Montreal.

Batley Price Increase.—The Batley Corporation have advanced the charge for gas, as from Oct. 1, to 4s. 6d. per 1000 c.ft. for all purposes, and the discount is reduced to 2½ p.ct. Hitherto the prices have been 4s. for trade purposes and 4s. 4d. for lighting. Slot meter consumers have to pay an extra 4d. in the shilling, instead of the former 3d.

Increases in Prices in Scotland.—Scottish gas-works are raising their charges to consumers. At Dunblane, the price is advanced 1s. 3d., making it 8s. 4d. per 1000 c.ft. The Larkhall Gas Company have made an increase of 7½d.; the rate now being 5s. 2½d. per 1000 c.ft. The Lauder Gas Company have fixed the rate 8s. 6d. per 1000 c.ft. Tayport has advanced the price 5d. to 4s. 7d.; and Bo'ness is the same rate of 4s. 7d.—the increase being 10d. per 1000 c.ft.

Coal Controller's Advice as to Gas-Fires.—Replying to general inquiries as to whether it is more useful in the national interest to save coal or gas, the Coal Controller says that every pound of coal and every foot of gas possible should be saved; but when filling up the requisition form, a householder should bear in mind that the national interests will best be served by saving coal before gas. This means that where a householder has used a gas-fire he should continue to use it in preference to a coal-fire; but the fire should not be kept alight a moment longer than is absolutely necessary.

A Huddersfield Retrospect.—Huddersfield, as a town, is celebrating its jubilee, and is indulging in reminiscences. It is 97 years since gas was first used there for lighting. The suppliers were the Huddersfield Gas Company, whose plant was bought by the Corporation in 1872—four years after incorporation; and two years later the works of the Moldgreen Gas Light Company were acquired. In 1840, the Huddersfield Company's output was 33 million c.ft. The present output of the Corporation is 839 millions a year. The gas charges have been among the lowest in the country; but the department has contributed extensively to the relief of the rates.

Irish Light Saving.—Addressing the Dublin Rotary Club, Mr. L. Sherlock, ex-Lord Mayor, outlined a scheme which he proposed to ask the Corporation to adopt for gaslight and electricity saving, in view of the coal shortage. This would involve the limitation of window and display lights, substantial reduction in general shop lighting, further reduction of public lighting, cancellation of unnecessary trams and trains, and the reduction of supplies to clubs and hotels. The Dublin Chamber of Commerce and other bodies have decided to close their offices earlier during the winter, so as to save lighting. In Belfast and other centres, the hours for evening services in many churches are to be altered and the services shortened to facilitate coal and light saving. In Ballymena, a town meeting agreed to earlier closing of shops and recommended the reduction of kitchen fires and hall lights in private houses. The Banbridge Urban Council rejected, by the Chairman's casting vote, a motion in favour of not lighting the public lamps in the winter season. Dungarvan has been in darkness for some time, owing to a dispute as to the gas lighting contracts.

Gas Poisoning at Banbridge.—A verdict of "Death from coal-gas poisoning" was returned at an inquest on the body of Andrew M'Calum, an ex-soldier, who was found dead in his home in Scarva Street, Banbridge. On behalf of the Gas Company, Mr. J. Gordon (Solicitor) said the question as to whether the unfortunate occurrence was due to any negligence on their part would probably be dealt with at another inquiry, when they would be prepared to prove that a pipe in deceased's house was properly sealed by them, and that it showed indications of having been tampered with, though not by any person in their service.

Wages at Dundee.—A letter was read at a meeting last week of the Dundee Gas Committee from the Organizer of the National Union of General Workers asking for a war advance of 10s. per week on existing rates for workers over eighteen years old, and 5s. for youths and girls under this age, with double time for Sundays and recognized holidays, and a corresponding advance for pieceworkers. Mr. Alex. Yuill (the Gas Engineer) said this was a national demand; and it was to be considered at a conference in London. It was decided that Mr. Yuill should attend this conference, and that they should await the result of the proceedings.

Lewes Gas Company.—The half-yearly meeting of the Company was held on the 11th inst.—Mr. M. S. Blaker presiding. The report of the Directors showed a profit on revenue account of £850. The balance of net revenue to profit and loss account was £2217; and dividends for the half year were recommended at the rate of 6 p.ct. per annum upon the original capital stock, and at £4 4s. p.ct. upon the additional capital stock. These dividends (after deduction of income-tax) would amount to £645. The Chairman referred to the satisfactory way in which the half-year's work had been carried out, considering the many difficulties they had had to contend with.

Hawick Gas Stokers' Wages Award.—The Committee on Production have issued their award (No. 2272) in regard to the wages of the stokers in the employ of the Hawick Gas Light Company. The question submitted was whether the demand of the stokers engaged in the manufacture of gas, tar, and trinitrotoluol, for an increase in wages of 1s. 5d. a shift, equivalent to a weekly increase of 10s.—from 53s. to 63s. a week—was reasonable, and, if not, what increase, if any, they could reasonably expect. Representatives of the parties were heard at Glasgow on Sept. 5. The pre-war rate of the men concerned was 5s. a shift. They had received, since the outbreak of the war, advances amounting in all to 2s. 7d. a shift. The decision of the Committee is that the men concerned shall receive an advance of 1s. 2d. a shift. The advance is to be taken into account in the calculation of payment for overtime or night duty, or for work on Sundays and holidays (where extra payment is made for such work), and is to be regarded as a war wage, and recognized as due to, and dependent on, the existence of the abnormal conditions prevailing in consequence of the war. The award is to take effect from the beginning of the first full pay following Sept. 5.

MILES PLATTING,
MANCHESTER.

SAWER
and
PURVES.
(BRANCH OF METERS, LTD.)

PREPAYMENT
METERS.

RADFORD ROAD,
NOTTINGHAM.

AGENT FOR SCOTLAND
JNO. D. GIBSON,
2, Causeyside St.,
PAISLEY.

Miners' Federation and Coal Control.—In response to the invitation of the Government to appoint a representative to assist the Coal Controller in the administration of the coal control, the Miners' Federation of Great Britain have replied that they do not see their way to do so. They suggest that the situation can be met by the holding of more frequent meetings of the Coal Advisory Board, on which they are represented. This suggestion is to be adopted.

The Maximum Price at Ossett.—The Ossett Corporation have approved a recommendation of the Gas Committee, that application be made for sanction to increase the maximum price for gas from 4s. to 5s. per 1000 c.ft. It was stated by the Chairman of the Committee (Alderman Harvey Robinson) that a report on the department's financial position showed that in the current year it was necessary to provide for an expenditure of £14,130 more than in the year immediately before the war. The price at Ossett, Horbury, and Crigglestone had already been advanced 1s. 6d., and at Shitlington 1s. 3d.; and it would be necessary to have a further 7d. from the three first-named places, and 10d. from the other. Last year there had been a loss of £1585, which, with the addition of a former deficiency, made a total deficit of £2322. If the increase to 5s. were made possible by Oct. 1, the loss on the current year would be only £1200, making a total deficiency on Sept. 30 of £3522.

Suggestions for Gas Saving.—The Lord Mayor of Belfast (Sir J. Johnston) stated, at a Corporation meeting, that the Chief Secretary told him that the Board of Trade were about to make an order for the compulsory earlier closing of shops during the winter, so as to effect a saving in coal, gas, and electricity. The Coleraine Urban Council have decided that no public lighting should be supplied in the coming winter, and that no gas should be furnished for dances in the Town Hall. The Lurgan District Council have resolved that a large number of public lamps should not be lighted during the winter.

Halifax and Coal Shortage.—Addressing a recent mass meeting of Halifax shopkeepers, called by the Chamber of Trade to consider earlier closing, so as to save fuel, Mr. W. B. M'Lusky (the Gas Engineer) said the coal shortage of the country would be 36 million tons. The miners brought back would make about 5 p.ct. difference. The stock of coal at the gas-works was 30 p.ct. less than last year, and 60 p.ct. less than the normal. The trouble was that they were not allowed to get more coal in December than in June. Closing the shops at 6 p.m. would effect a reduction of 45 p.ct. in lighting. Between 4.30 and 5.30 the gas consumption was one-tenth of that of the whole 24 hours. The meeting decided on 6 o'clock closing on most nights, 7 on Fridays, and 8 on Saturdays. The Huddersfield Chamber of Trade have come to a similar decision.

STOCK MARKET REPORT.

THE Stock Exchange has had a rather dull week. Why this should have been is not quite evident on the face of things; for surely the military intelligence from the war fronts left nothing to be desired. But Capel Court was in one of its lethargic moods of irresponsiveness; and markets, with a bright exception here and there, had not much backbone in them. Prices suffered accordingly.

The gilt-edged market was not among the moping ones; and Home Government issues were enlivened by the further advance of Consols, which changed hands at 59. Home Rails were firm at first, but gradually sank into somnolence. Canadians were rather variable; but Argentines were better.

The Foreign Market was quieter and less interesting. French loans shaped easier early in the week, but recovered towards the close. The Miscellaneous Market absorbed most of the business of the week with its superior speculative attractions. Rubber was much neglected and had but a dull time, and Oil was hampered by realizations to secure profits. Armaments and Munitions, however, were firm and active, and Shipping, Textiles, and Meats were in demand.

Business in the Gas Market was fair—perhaps just a little more than the array of the previous week in point of aggregate; and it was more equitably distributed through the list. The general tendency, as shown by the figures of bargains recorded, indicated no change except in one or two special lines. The reaction in Imperial Continental after its recent great rise continued, and transactions at 105 were recorded—the quotation dropping 7 points. Alliance and Dublin debenture rose 5, British and European ½ each, and Hastings, Hornsey, Ilford, Lea Bridge, and North Middlesex gained more or less on *ex div.* adjustment.

Bargains done for cash during the week were as follows: On Monday, Alliance and Dublin debenture 64⅜, Gas Light ordinary 64½, 65, ditto preference 67¼, Imperial Continental 112, Primitiva 33s. 6d., 35s., 36s., South Metropolitan 66½. On Tuesday, Bombay 5, Brighton and Hove preference 60½, British 30¾, Continental Union 44, 45, European 11⅜, 11⅝, Gas Light preference 67, 67½, ditto debenture 55, 55½, Imperial Continental 109, 112½, Primitiva 35s., 36s., ditto preference 57s., 57s. 6d., South Metropolitan 65¼, 65½, 65⅝, 66, South Suburban 69¼. On Wednesday, Bombay 5, British 31, Continental Union preference 65, European 11⅝, Gas Light ordinary 64, 64¼, 64⅜, 65, ditto preference 67½, ditto debenture 55½, Primitiva 35s., 37s., ditto preference 58s., South Metropolitan 65, 66, South Suburban 69½, 70. On Thursday, Bombay 5¼, 5⅜, Gas Light ordinary 64⅛, 64½, 64¾, Imperial Continental 105, 108, 109, 111, Primitiva 36s. 3d., 37s., South Metropolitan 65, South Suburban 69½, 70, Southampton 69¼, 69⅝. On Friday, Continental Union preference 68, European 11¼, 11⅜, Gas Light ordinary 64, 64¼, 64½, 64⅝, 65, ditto debenture 56, Imperial Continental 105, 106, 108, 110, Primitiva 35s., 36s. 3d., 37s., ditto preference 57s., South Metropolitan 65, South Suburban, West Kent, 62, Malta and Mediterranean preference 4¾.

The Money Market was somewhat variable; but rates for the most part were fairly easy. The Bank rate is 5 p.ct., as fixed on April 5, 1917.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue. £	Shares.	When ex-Dividend.	Ante-War Dividend & Bonus p.c.	Last Dividend.	NAME.	Closing Prices. July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
123,049	Stk.	Mar. 10	4	4%	Aldershot 4 p.c. Pref.	..	55—60	..
1,551,868	,,	April 8	2½	4¼%	Alliance & Dublin Ord.	59—64	59—64	..
974,000	,,	July 10	4	4%	Do. 4 p.c. Deb.	76—79	62—67	64⅜
280,000	5	April 29	7⅛	8%	Bombay, Ltd.	5⅞—6	5—5½	5—5⅛
50,000	10	Feb. 26	16	11%	Bournemouth Gas and Water { 10 p.c.	22—30	20—22	..
888,110	10	,,	7	7%	B 7 p.c.	15—15½	10—11	..
115,000	10	,,	6	6/-	Pref. 6 p.c.	13½—14	9—9½	..
159,740	—	—	—	4%	4 p.c. Deb.	..	66—68	..
992,045	Stk.	Feb. 26	14	4½%	Brentford A Consolid.	261—266	73—76	..
794,920	,,	,,	11	4½%	Do. B New	204—209	65—68	..
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	77—82	..
221,400	,,	June 11	4	4%	Do. 4 p.c. Deb.	91—93	62—64	..
217,880	,,	Feb. 26	11	8½%†	Brighton & Hove Orig.	208—213	135—140	..
244,300	,,	,,	8	5½%†	Do. A Ord. Stk.	154—159	95—100	..
530,000	20	Mar. 26	12½	22/6	British	44—45	30½—31½	30½—31
120,000	Stk.	June 26	4	4%	Do. 4 p.c. Deb. Stk.	88—90	64—66	..
245,771	,,	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	50—53	..
100,000	10	—	—	—	CapeTown & Dis., Ltd.	1½—2½	3⅜—4½	..
100,000	10	—	—	4½%	Do. 4½ p.c. Pref.	4—6	7—8	..
100,000	Stk.	June 26	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	60—65	..
157,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	79—81	..
1,518,380	,,	Feb. 12	5/9¼	36/-	Commercial 4 p.c. Stk.	105—108	56—61	..
560,000	,,	,,	5½	30/-	Do. 3½ p.c. do.	103—105	53—58	..
475,000	,,	June 11	3	3%	Do. 3 p.c. Deb. Stk.	69½—71½	51—53	..
800,000	,,	,,	4	—	Continental Union Ltd.	76—79	43—48	44—45
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	65—70	65—68
276,400	—	—	—	10½%	Croydon B and C 7 p.c.	..	140—150	..
—	—	—	—	10%	Do. E	..	..	..
492,370	Stk.	—	6	5½%	Derby Con. Stk.	133—135	95—100	..
55,000	,,	—	4	4%	Do. Deb. Stk.	103—104	80—83	..
1,002,180	10	July 29	10	5/0	European, Ltd.	17½—18	11—12	11⅜—11⅞
16,298,975	Stk.	Feb. 10	4/17/4	29/4	Gas { 4 p.c. Ord.	98—102	64—66	64—65
2,600,000	,,	,,	3½	3½%	Light { 3½ p.c. max.	76—79	52—54	..
4,062,235	,,	,,	4	4%	and { 4 p.c. Con. Pref.	96—99	66—68	67—67½
4,674,850	,,	June 11	3	3%	Coke { 3 p.c. Con. Deb.	72½—74½	54—56	55—56
180,000	,,	,,	10	10%	10 p.c. Bonds	..	..	..
258,740	,,	Mar. 12	5	2⅜%	Hastings & St. L. 3½ p.c.	87—89	45—50*	..
70,000	10	April 29	11	6%	Hongkong & China, Ltd.	16½—16¾	7—8	..
86,600	—	—	—	9½%	Hornsey 7 p.c.	..	112—117*	..
181,000	Stk.	Mar. 12	7½	6½%	Ilford A and C.	151—154	88—93*	..
65,780	,,	,,	6¾	4⅜%	Do. B	115—118	68—73*	..
65,500	,,	June 26	4	4%	Do. 4 p.c. Deb.	92—94	62—65	..
4,940,000	,,	May 14	9	4½%	Imperial Continental	150—160	105—110	105—112½
1,235,000	,,	Feb. 12	3½	3½%	Do. 3½ p.c. Deb. Red.	84—86	70—72	..
235,242	,,	Mar. 12	6¾	6¾%	Lea Bridge Ord. 5 p.c.	119—121	92—97*	..
2,498,905	,,	Feb. 26	10	5%	Liverpool 5 p.c. Ord. { A	211—213	82—84	..
					{ B	146—148		..
306,088	,,	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	..	71—78	..
75,000	5	June 11	6	3%	Malta & Mediterranean	4½—4⅝	3½—3⅝*	..
250,000	100	April 1	4½	4½%	Met. of Melbourne { 4½ p.c. Deb.	99—101	88—99	..
541,920	20	May 26	4	6/-	Monte Video, Ltd.	11½—12	8⅜—9½	..
1,875,892	Stk.	July 29	4½	3½%	Newcastle&Gatsh'dCon.	98½—99½	64—66	..
539,705	,,	June 26	3½	3½%	Do. 3½ p.c. Deb.	82—83	59—61	..
55,940	10	Feb. 26	7/14/0	7⅛	North Middlesex 7 p.c.	14—15	9½—10½*	..
300,000	Stk.	May 14	8	8%	Oriental, Ltd.	117—122	102—104	..
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7½—7⅝	3—4	..
60,000	50	Feb. 26	18	9%	Porisea, Island B	128—131	78—83	..
100,000	50	,,	12	6%	Do. C	118—121	73—78	..
62,000	50	,,	10	6%	Do. D	..	..	..
249,986	5	April 29	8	—	Primitiva Ord.	5½—6	1⅝—1⅞	33/6—37/-
499,960	5	June 26	5	2/6	Do. 5 p.c. Pref.	4½—5	2½—3	57/—58/-
521,600	100	June 2	4	4%	Do. 4 p.c. Deb.	91—98	75—77	..
—	—	—	—	4%	Do. ,, ,, 1911	..	50—55	..
346,198	Stk.	June 26	4	4%	River Plate 4 p.c. Deb.	86—87	55—60	..
150,000	10	May 14	6	6/-	San Paulo { 6 p.c. Pref.	10½—11	7½—7⅞	..
125,000	50	July 1	5	5%	{ 5 p.c. Deb.	47—49	40—42	..
135,000	Stk.	Mar. 12	10	10%	Sheffield A	233—234		..
209,984	,,	,,	10	10%	Do. B	233—234	170—173	..
638,500	,,	,,	10	10%	Do. C	230—232		..
90,000	10	May 28	9	6/-	South African	10½—11½		..
6,609,896	Stk.	Feb. 10	5/4/0	32/-	South Met. 4 p.c. Ord.	111—113	65—67	65—66½
250,000	,,	July 12	—	5%	Do. Pref.	..	91—98	..
1,895,445	,,	July 10	8	8%	Do. 3 p.c. Deb.	72½—74½	53—55	..
234,820	,,	Feb. 26	8½	6%	South Shields Con. Stk.	157—159	118—119	..
952,796	,,	,,	6	3½%	S'th Suburb'n Ord. 5 p.c.	114—116	69—71	69½—70
60,000	,,	,,	5	5%	Do. 5 p.c. Pref.	110—112	73—75	..
135,000	—	—	—	3½%	Do. West Kent	..	..	62
197,558	Stk.	June 26	5	5%	Do. 5 p.c. Deb. Stk.	116—118	83—85	..
647,740	,,	May 14	5	3%	Southampton Ord.	99—102	68—71	69½—69⅞
120,000	,,	Feb. 12	7½	5½%	Tottenham { A 5 p.c.	135—138	88—93	..
782,375	,,	,,	6	4%	District { B 3½ p.c.	115—117	64—66	..
181,255	,,	June 26	4	4%	{ 4 p.c. Deb.	87—89	61—63	..
189,880	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	..
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	45—50	..
236,476	Stk.	Mar. 12	5	5%	Tynemouth 5 p.c. max.	103½—109½	87—88	..
					Wandsworth, Wimbledon, and Epsom—			
80,000	,,	Feb. 26	8⅜	63/9	Wandsworth A 5 p.c.	151—156	83—93	..
255,686	,,	,,	6⅞	48/9	Do. B 3½ p.c.	129—134	68—73	..
108,075	,,	,,	5/17/8	44/7½	Do. C 3½ p.c.	116—115	68—73	..
362,000	,,	,,	6⅛	42/6	Wimbledon 5 p.c.	117—123	68—73	..
98,000	,,	,,	6⅞	48/9	Epsom 5 p.c.	131—136	68—73	..
88,416	,,	June 26	3	3%	3 p.c. Deb. Stk.	56—60	48—51	..

* Ex Div. † Next Dividend will be at this rate.

An Arbitrator has decided against the claim of the Belfast gas workers that the war-wages scale recently agreed to should date from March 7 instead of May 1.

The plant of the Limavady (co. Londonderry) Gas-Works, which was closed down last April, is now being offered for sale. An electric lighting system has been introduced.

An explosion of gas in Pellon Lane, Halifax, on Tuesday afternoon, which did much damage to a house, was caused, it is believed, by the fusing of an underground electric cable.

It is generally admitted in Shipley that the quality of the local Council's gas, which has been very bad for a number of years, is now greatly improving, as a result of the extensive repairs at the works which have been carried out since Mr. H. Higham, formerly of the Bradford Corporation Gas Department, took charge of the undertaking last year. The repairs are now completed.

To cope with the shortage of coal, the Argentine Government have supplied the German Transatlantic Electricity Company with river vessels for the transportation of wood; and the Company have purchased large quantities of maize for use as fuel. For the same purpose, the Buenos Aires Gas Company are even stated to be considering the purchase of 4000 tons of low-grade flour.

On a recent occasion, injuries were sustained by three persons at Oxford by explosions, one of which occurred in a street and the other in a cellar. In a statement to the Press, the City Engineer explained that the electric light cables fused at a point where two gas-mains crossed over them, with the result that the gas-pipes were burnt through, and the gas immediately took fire. At the time the three covers of the chambers of the electric cables were off, and there was no smell of gas perceptible at them. Gas, however, found its way into a chamber on the line of the telegraph cable, and by some means was ignited and exploded. With regard to the explosion in the cellar, it was evident that some of the gas had accumulated there, and appearances pointed to the probability of someone having taken a naked light into the place. In relaying the electric cable, it is being placed in a wooden trough filled with bitumen, so as to keep it from contact with pipes; and it is hoped this will prevent any such occurrence in future.

At the monthly meeting of the Rothesay Town Council last Monday week, it was unanimously agreed to increase the salary of Mr. William Whyte, the Gas Engineer, by £75 per annum, to date from May 15 last.

The Treasury have offered no objection to the borrowing by the Walsall Town Council, under the provisions of the Corporation Act of 1900, of a further sum of £10,000 for the purposes of the gas undertaking.

Messrs. J. Brown & Co., Ltd., manufacturing chemists, of Savile Town, Dewsbury, have, as and from the 2nd inst., taken over as a going concern the chemical works at Gomersal hitherto owned by Messrs. W. Crowther & Sons.

The Bill of the Rotherham Corporation, which has passed through all its stages in Parliament, provides for the purchase of coke-oven gas and its supply to the residents in a crude state. The village of Canklow has for some time been supplied with gas from the ovens at the Rotherham Main Colliery; and now it is reported that an agreement has been arrived at between the Company and the Corporation by which the supply from this source will be extended to cover a further portion of the Corporation's area. The volume of gas so taken averages about 100,000 c.ft. daily.

Under the auspices of the Federation of British Industries, with the sanction of His Majesty's Government and the Royal Hellenic Government, a tour of works in this country is being undertaken by Greek commercial delegates. In carrying through the comprehensive itinerary arranged, some twenty-five towns will be visited; and among the large number of works to be inspected may be noted those of the United Alkali Company, of Widnes, the British Westinghouse Electric and Manufacturing Company, of Trafford Park, Manchester, Messrs. Thomas Firth & Sons, Messrs. John Brown & Co., and Messrs. Hadfields, of Sheffield, the Carron Company and Messrs. Stewarts and Lloyds, of Glasgow, and the Port Talbot Steel Company, of Port Talbot. After spending four days in London, the delegates will leave for Birmingham on Thursday of this week; and the tour will close on Wednesday, the 23rd prox., with a Federation lunch at the Ritz Hotel, and the formation of the Association of Great Britain and Greece (Industry and Economics).

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

GAS ENGINEER AND MANAGER. Nantwich Urban District Council. Applications by Sept. 30.
GAS ENGINEER AND MANAGER. Newtownards Urban District Council. Applications by Oct. 5.
RESIDENT MANAGER. Leominster Gas Company.
CHEMIST (GAS-WORKS). Wigan Corporation. Applications by Sept. 23.
SUPERINTENDENT OR GENERAL FOREMAN. Aldershot Gas, Water, and District Lighting Company.
GENERAL FOREMAN. Keighley Gas Department. Applications by Sept. 25.
WORKING MANAGER. S. G. Tulk, Builth Wells.

Appointments, &c., Vacant (*Continued*).

ELECTRICIAN (FOR REPAIRS). Bolton Gas Department.
OPERATOR FOR WATER GAS PLANT. No. 6499.

FOREMAN. Port Glasgow Gas-Works.
RETORT-HOUSE FOREMAN. Stretford Gas Company.
STOKER. Audley Gas-Works.

Appointments, &c., Wanted.

ENGINEER AND MANAGER OR ASSISTANT. No. 6498.
ENGINEER AND MANAGER OR ASSISTANT. No. 6500.
ENGINEER, &c. (Discharged Officer). No. 6491.

Plant, &c., for Sale.

METER. William Dixon, Ltd., Glasgow.

Plant, &c., Wanted.

METER. Conner Magneto Company, Coventry Retort-House Governor. No. 6497.
RADIATORS. Blue Bird Motor Company, Ltd.
RETORT-HOUSE GOVERNOR. No. 6497.

Meeting.

BRITISH GAS LIGHT COMPANY. No 11, George Yard, Lombard Street, E.C. Sept 25, Twelve o'clock.

Price—with Large Sheet Diagram—5s.,
Free by Post in the United Kingdom.

Low Pressure Gas Distribution

A Diagram with a Description of a Rapid Method of Graphical Solution of Problems relating to Mains and Systems of Mains.

By W. MARSH HAMPTON, B.Sc. (London).

LONDON
WALTER KING, "Gas Journal" Office, 11, Bolt Court, Fleet Street, E.C. 4.

Price, Bound in Cloth, 7s. Post Free in the United Kingdom

THIRTY-FIFTH YEAR.

The Complete Reports of Proceedings

OF THE

DISTRICT ASSOCIATIONS OF GAS MANAGERS for 1917.

Most of the previous Volumes are still on Sale.
Price 5s. 6d. each.

LONDON: WALTER KING, 11, Bolt Court, Fleet Street, E.C. 4.

OXIDE OF IRON.

O'NEILL'S OXIDE
For GAS PURIFICATION.
LARGEST SALE OF ANY OXIDE.

SPENT OXIDE PURCHASED IN ANY DISTRICT

GAS PURIFICATION & CHEMICAL CO., LD.,
PALMERSTON HOUSE,
OLD BROAD STREET, LONDON, E.C.

"VOLCANIC" FIRE CEMENT.
Resists 4500° Fahr. Best for Gas-Works.
ANDREW STEPHENSON, Gresham House, Old Broad Street, LONDON, E.C. "Volcanism, London."

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E. 1.
WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.
REPAIRS RECEIVE PROMPT ATTENTION.
Telephones: 815 Oldham, and 2412 Hop, London.
Telegrams—
"BRADDOCK, OLDHAM," and "METRIQUE, LAMB, LONDON."

BENZOL PLANTS FOR GAS-WORKS.

BAGLEY, MILLS, & CO., Ltd.,
92, Victoria Street, Westminster, S.W. 1. Invite inquiries from all Gas-Works making 75 million cubic feet and upwards per annum.

OXIDE OF IRON.
SPENT OXIDE WANTED.

BALE & CHURCH, LTD.
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Avenue 6680.

"TORTO" FIRE CEMENT.

BALE & CHURCH, LTD.
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Avenue 6680.

"KLEENOFF," THE COOKER CLEANSER.
Tins for Sale to Consumers.
In Bulk for Works Use.

BALE & CHURCH, LTD.
33, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Avenue 6680.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer—not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders to Alter or stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Saturday.

Wanted, For Sale, and Tender Advertisements, Six Lines and under 3s.; each additional Line, 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

United Kingdom: One Year, 23s. 6d.; Half Year, 12s.; Quarter, 6s. 6d. Payable in Advance. If credit is taken, an extra charge of 4s. a year is made.

Abroad (in the Postal Union): £1 7s. 6d., payable in advance.

In payment of subscriptions for "JOURNALS" sent abroad, Post Office Orders or Bankers' Drafts on London only are accepted.

All Communications, Remittances, &c., to be addressed to WALTER KING, 11, BOLT COURT, FLEET STREET, LONDON, E.C. 4.

Telegrams: "GASKING, FLEET LONDON." Telephone: Holborn 6857.

ROBERT DEMPSTER & SONS, Ltd., Contractors for Complete CARBONIZING PLANTS and every Description of GAS APPARATUS, ELEVATING, CONVEYING, and TELPHERAGE PLANTS, also STOKING MACHINERY, ROSE MOUNT IRONWORKS, ELLAND.

BRITISH GAS PURIFYING MATERIAL.

ENGLISH BOG ORE AND NATURAL HYDRATED OXIDE OF IRON.
SPENT OXIDE BOUGHT.

BRITISH GAS PURIFYING MATERIALS CO., LTD.
(W. T. P. CUNNINGHAM, Chief Proprietor and Managing Director.)
13, ARCADIAN GARDENS, WOOD GREEN, LONDON, N. 22.
Telegrams: "Bripurimat, Wood, London." 'Phone: Palmer's Green 608.

ALDER AND [illegible]CKAY, LTD. (ESTABL[illegible] 1850).
WET AND DRY METERS,
SLOT AND ORDINARY.
STREET LAMPS AND AUTOMATIC CONTROLLERS.
EDINBURGH.
(See p. 546.)

JAMES MILNE & SON, LTD., (ESTABLISHED 1750.)
SLOT AND ORDINARY DRY METERS.
EXTENSIVE RANGE OF USEFUL GAS WORKS' ACCESSORIES.
EDINBURGH, GLASGOW, and LEEDS.

HUTCHINSON BROTHERS, Ltd., FALCON WORKS, BARNSLEY.
MANUFACTURERS OF
GAS METERS (Ordinary and Prepayment),
"FALCON" INVERTED LAMPS and SQUARE LANTERNS for Street Lighting,
INVERTED BURNERS and CONVERSION SETS for Street Lamps.

SULPHURIC ACID.

SPECIALLY prepared for the manufacture of SULPHATE OF AMMONIA.
SPENCER CHAPMAN & MESSEL, LTD., with which is amalgamated WM. PEARCE & SONS, LTD., Mark Lane, LONDON, E.C. Works—SILVERTOWN.
Telegrams—"HYDROCHLORIC, FEN, LONDON."
Telephone—1588 AVENUE (3 lines).

SULPHATE OF AMMONIA SATURATORS and all LEAD and TIMBER WORK in connection with Sulphate Plants.
We Guarantee promptness with efficiency for Repairs.
JOSEPH TAYLOR AND CO., CENTRAL PLUMBING WORKS, BOLTON.
Telegrams—"SATURATORS, BOLTON." Telephone 0848.

SPENCER'S Patent Inclined HURDLE GRIDS.

THE very best Patent Grids for Holding Oxide Lightly.
See Illustrated Advertisement, Aug. 20, p. 368.

J. E. C. LORD, Ship Canal Tar Works, Weaste, Manchester. Pitch, Creosote, Benzols, Toluol Naphtha, Pyridine, all kinds of Cresylic Acid, Carbolic Acid, Sulphate of Ammonia, &c.

MEWBURN, ELLIS, AND PRYOR.

CHARTERED PATENT AGENTS AND TRADE MARK AGENTS,
70, Chancery Lane, London.
Telegrams: "Patent, London." 'Phone: 243 Holborn.
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

"FERROX." "FERROX." "FERROX."

A BRITISH Oxide Cheaper and Better than Bog Ore. 35 per cent. Water, 75 per cent. Ferric Hydrate.
For Sale outright or on Loan.
OXIDE LIMITED, Brentford, MIDDLESEX.

SEND your inquiries for Carburetted HYDROGEN AND BLUE WATER-GAS PLANT, also TAR DEHYDRATING PLANT and other GAS-WORKS APPARATUS to—
BALE AND HARDY,
39, VICTORIA STREET, WESTMINSTER, S.W. 1.

TAR AND GAS LIQUOR WANTED IN LONDON DISTRICT.

THOMAS CLAYTON (Oldbury), Ltd., BRENTFORD, W.
Telegrams: Canal, Brentford. 'Phone: Ealing 17.

ENQUIRIES SOLICITED

FOR Gas-Works Plant of Every Description; also SULPHATE OF AMMONIA and SULPHUR RECOVERY PLANTS.
C. & W. WALKER, LIMITED, DONNINGTON, NEWPORT, SALOP.

JOHN RILEY & SONS, Limited, Chemical Manufacturers, Hapton, near Accrington, are MAKERS of Special SULPHURIC ACID, for Sulphate of Ammonia Making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol, which has now been used for upwards of 60 years. Reference given to Gas Companies.

GAS-WORKS requiring Extensions should Communicate with FIRTH BLAKELEY, SONS, AND CO., LIMITED, Dewsbury, who make a Speciality of Catering for the Smaller Gas Concerns. Prices Reasonable; quality and results, the best. Satisfaction Guaranteed.

CITY AND GUILDS GAS EXAMINATIONS.

MR. CRANFIELD'S well-known CORRESPONDENCE CLASSES enable Students to surmount the War Time difficulties of Scanty Leisure and the Scarcity of Classes. Individual Attention given to Students, and the Highest Results obtained Year by Year.
Full Particulars on Application to MANOR COURT AVENUE, NUNEATON.

CORRESPONDENCE TUITION in GAS ENGINEERING for City and Guilds Institute Exams. (Preliminary and Final). Successful Results. Low Fees.
PENNINGTONS ENGINEERING TUTORS, 254, Oxford Road, MANCHESTER.

OFFICER (Royal Engineers) about to get Discharge from Army after 3½ Years' Active Service, is open to Take Up Professional Duty with Gas Undertaking or Gas Engineering Firm, towards the end of September.
Details of Professional Experience and previous Appointments supplied on application to No. 6491, care of MR. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

AN Assistant Engineer and Manager, M.I.M.E., in a large works Desires Change, either as Engineer and Manager or as Assistant. Workshop and Contractor's Office Experience, Good Draughtsman, Chemist, &c. Practical Experience of Modern Gas-Works, both Horizontal and Vertical Retorts. Excellent References and Testimonials.
Address No. 6498, care of MR. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

WANTED.—Position as Engineer and Manager of Small or Medium Sized Works, or Assistant Engineer and Manager, Works Superintendent, or any Responsible Position on larger works. Advertiser is Fully Qualified and Experienced in all Branches, including Modern Bye-Product Recovery. Highest References.
Full Details of previous Engagements on Application to No. 6500, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

WANTED by the Leominster Gas Company a RESIDENT MANAGER. Pre-War Make, 30 Million Cubic Feet. Must be Active, capable of Managing Labour, and Tactful with Consumers.
Modern House and Large Garden Rent Free. Gas and Coal provided free.
Applications, stating Age, Salary, and Experience, to be sent to the SECRETARY, Gas-Works, LEOMINSTER.

NEWTOWNARDS URBAN DISTRICT COUNCIL.

APPOINTMENT OF GAS ENGINEER AND MANAGER.

THE above Council are prepared to receive Applications for the Position of GAS ENGINEER and MANAGER, at a commencing Salary of £270—free Fuel and Light.
Applicants will please state Age, Qualifications, and Experience, and submit Testimonials (*copies* only). A good knowledge of the Treatment of Bye-Products and both High and Low-Pressure Systems is essential. This arrangement to be terminable by three months' notice on either side.
No Canvassing allowed.
Applications to be sent to undersigned on or before Saturday, Oct. 5. Envelopes endorsed "Gas Managership."

H. MCCARTNEY,
Clerk to the Council.

Town Hall,
Newtownards,
Sept. 9, 1918.

NANTWICH URBAN DISTRICT COUNCIL.

APPLICATIONS are invited for the Position of GAS ENGINEER and MANAGER. Present make of Gas, 52 Million Cubic Feet per Annum.
Salary, £280 per Annum, with no additional Allowances.
Application, endorsed "Gas Manager," to be made on Form to be obtained from the undersigned and to be sent in not later than Sept. 30 inst. to

A. E. WHITTINGHAM,
Clerk to the Council.

7, Mill Street,
Nantwich,
Sept. 10, 1918.

WANTED.—A Working Manager. Present make of Gas, Six Millions per Annum. Must be a Good Carbonizer and Fitter—one having held a Similar Position preferred.
Apply, with References, stating Wages required (with Cottage on the Works, Coal and Gas Free), to S. G. TULK, BUILTH WELLS, Breconshire.

BOLTON CORPORATION.
(GAS DEPARTMENT).

WANTED—Electrician for Repairs and Maintenance of Gas-Works Electrical Plant.
Apply to the ENGINEER and MANAGER, Lum Street Gas-Works, BOLTON.

OPERATOR Wanted for Carburetted Water-Gas Plant in Yorkshire. State Training and Experience. Good Permanent Position for Suitable Man.
Apply, by letter, to No. 6499, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

ALDERSHOT Gas, Water, and District Lighting Company, Ash Road, Aldershot, North and South Works, Output about 600 Million Cubic Feet per Annum. SUPERINTENDENT or GENERAL FOREMAN Wanted. Must be a First-Class Carbonizer, with Experience in the Manufacture of Carburetted Water Gas and Recovery of Bye-Products, including Benzol. One with Mechanical Training Preferred, as the Works are Equipped with Electrically Driven Modern Coal, Coke, and Stoking Plants; and a complete self-contained (Vertical Engines) Gas Driven Electricity Station is in the Works.
Wages, £5 per Week and Large Free House on Works.
Apply, with Testimonials, stating Full Experience and How Early could Commence Duties if Appointed.

W. FISH,
Secretary.

SOLE MAKERS OF THE CONTINENTAL & COAL WASHER. Victoria St., S.W. 1. MANCHESTER.